Thunder n3600R /// S2912-E

Version 1.0

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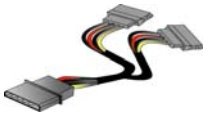
Check the box contents!

The retail motherboard package should contain the following:

1x Thunder n3600R motherboard

1x 34-Pin floppy drive cable

6 x SATA cable



3 x SATA Drive Power Adapter

1 x Ultra-DMA-100/66 IDE cable

2 x SAS cable (for S2912WG2NR-E only)

1 x Thunder n3600R User's Manual

1 x Thunder n3600R Quick Reference Guide

1 x TYAN driver CD

1 x I/O shield

If any of these items are missing, please contact your vendor/dealer for replacement before continuing with the installation process.

NOTE

Chapter 1: Introduction

1.1 - Congratulations

You have purchased one of the most powerful server solutions available. The Thunder n3600R (S2912-E) is a high-end server motherboard, based on the NVIDIA NPF3600 chipset. It also includes the Winbond W83627HF Super IO and Analog Devices ADT7476 Hardware Monitoring chipsets.

This motherboard is designed to support two AMD Opteron 2000 Series processors and up to 64GB of DDR2 400/533/667/800 memory. The S2912-E is ideal for high-density performance serving and clustering, data center and IT infrastructure development. The S2912-E is also ideal for multi-node rendering and processing, web and business application serving, Large-scale visual simulations.

Remember to visit TYAN's website at http://www.tyan.com. There you can find information on all of TYAN's products with FAQs, online manuals and BIOS upgrades, and validated **DDR2 800** Memory module list.

1.2 - Hardware Specifications

Processors

- Dual 1207-pin ZIF sockets
- Supports up to two AMD Opteron 2000 Series processors
- Up to 1.0GHz Hyper-Transport link support
- AMD Dual Dynamic Power support

Chipset

- NVIDIA NPF3600
- Winbond W83627HF Super IO
- Analog Devices ADT7476 Hardware Monitoring IC

Integrated I/O

- One floppy connector supports up to two drives
- One IDE connector supports up to two ATA 133 devices
- One parallel port header and one serial port
- Eight USB 2.0 EHCI ports (two rear connectors and six headers)

Onboard SAS Controller (for S2912WG2NR-E only)

Memory

- Dual-channel memory bus
- Eight DDR2 sockets (four per CPU)
- Supports ECC Registered DIMMs
- Maximum of 64GB
- Supports DDR2-400/533/667/800

Integrated Network Processor

- Two GbE via Marvell PHY 88E1121
- Supports WOL and PXE
- Two RJ-45 ports with LEDs

Integrated SATA Controllers

- Three Integrated dual port SATA Controllers from NFP3600
- Supports up to 6 SATA drives
- Supports up to 3.0Gb/s
- Supports 4 independent SATA ports
- Supports RAID 0, 1, 0+1, 5, JBOD-

Integrated Video Controller

- ATI ES1000
- PCI Interface
- 32MB DDR memory

- LSI 1064E SAS controller
- Four SAS ports
- Supporting RAID 0 (Integrated Stripping), RAID 1E (Integrated Enchanced Mirroring) and RAID 1 (Integrated Mirroring)

System Management

- CPU thermal & voltage monitor support
- Six 4-pin fan header (PWM and tachometer support)
- One 2-pin chassis intrusion header
- Watchdog timer support

Expansion Slots

- Two PCI Express x 16 slots
  - one with x16 signal
  - one with x8 signal
- One HTX-pro connector

- supports Pathscale InfiniPath HTX Adapter

- One OPMA connector for KVM

Form Factor

- SSI / Extended ATX (12” x 13”)
- EPS 12V/SSI (24 + 8 + 4 pin) power connectors
- Stacked PS/2 keyboard and mouse connectors
- Stacked Serial (1) connector
- Stacked VGA (1) connector
- Stacked USB 2.0 (2)
- Stacked RJ-45 (2) connectors for GbE LAN
- Stacked RJ-45 (1) connector for OPMA

BIOS

- Phoenix BIOS on 8Mbit LPC Flash ROM
- Supports ACPI (S0, S1, S3, S4, S5)
- Serial Console Redirect
- PXE via Ethernet, USB device boot
- PnP, DMI 2.0, WfM 2.0 Power Management
- User-configurable H/W monitoring
- Auto-configuration of hard disk types
- Multiple boot options
- 48-bit LBA support

Regulatory

- FCC Class B (DoC)
- European Community CE (DoC)
- BSMI (optional)

Chapter 2: Board Installation

Precautions: The Thunder n3600R supports SSI, EPS12V type power supplies (24pin + 8pin +4pin) and will not operate with any other types. For proper power supply installation procedures see page 32.

DO NOT USE ATX 2.x or ATXGES power supplies as they will damage the board and void your warranty.

How to install our products right… the first time

The first thing you should do is reading this user's manual. It contains important information that will make configuration and setup much easier. Here are some precautions you should take when installing your motherboard:

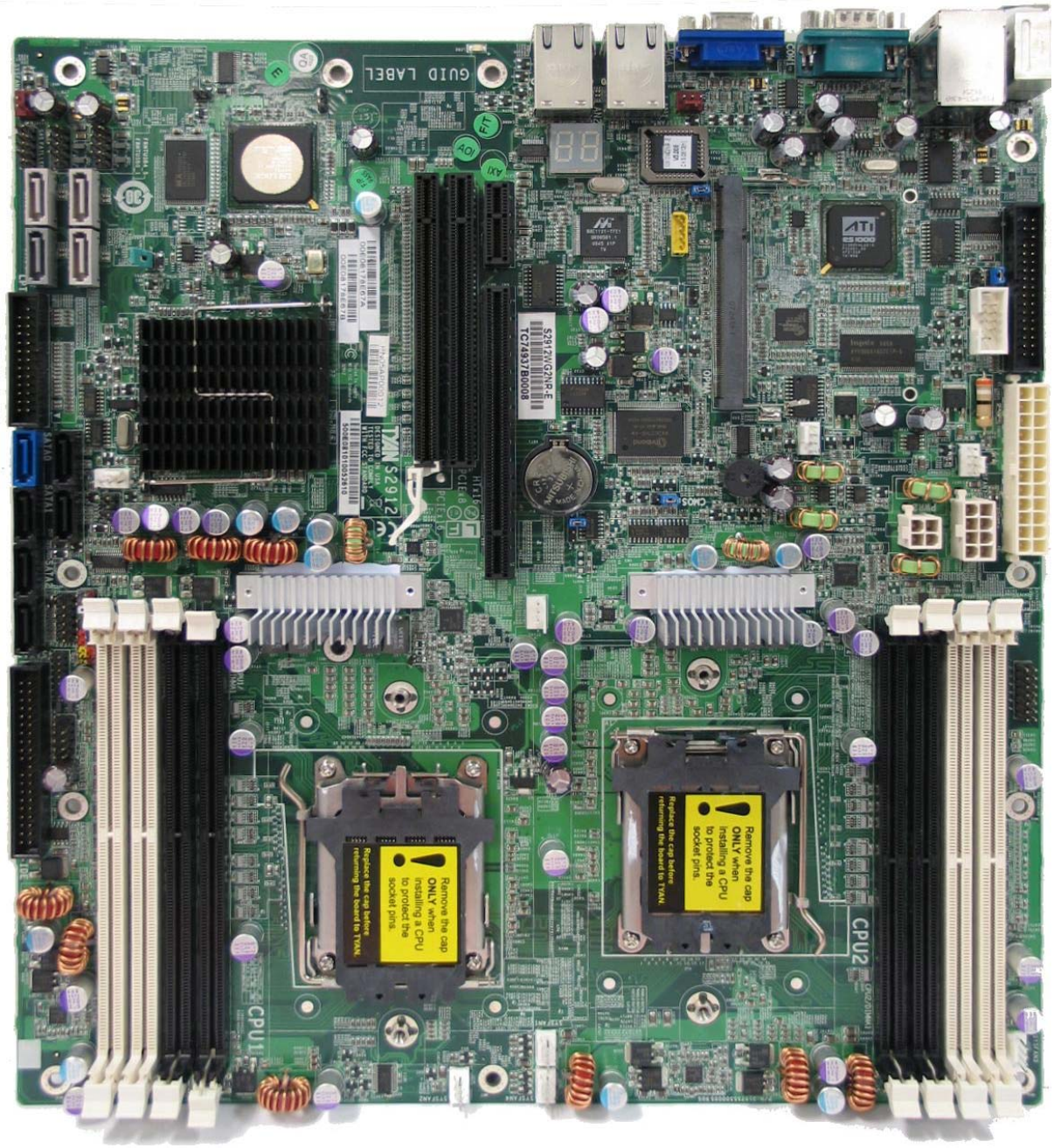
(1) Ground yourself properly before removing your motherboard from the antistatic bag. Unplug the power from your computer power supply and then touch a safely grounded object to release static charge (i.e. power supply case). For the safest conditions, TYAN recommends wearing a static safety wrist strap.
(2) Hold the motherboard by its edges and do not touch the bottom of the board, or flex the board in any way.
(3) Avoid touching the motherboard components, IC chips, connectors, memory modules, and leads.
(4) Place the motherboard on a grounded antistatic surface or on the antistatic bag that the board was shipped in.
(5) Inspect the board for damage.

The following pages include details on how to install your motherboard into your chassis, as well as installing the processor, memory, disk drives and cables.

NOTE	**DO NOT APPLY POWER TO THE BOARD IF IT HAS BEEN DAMAGED.**

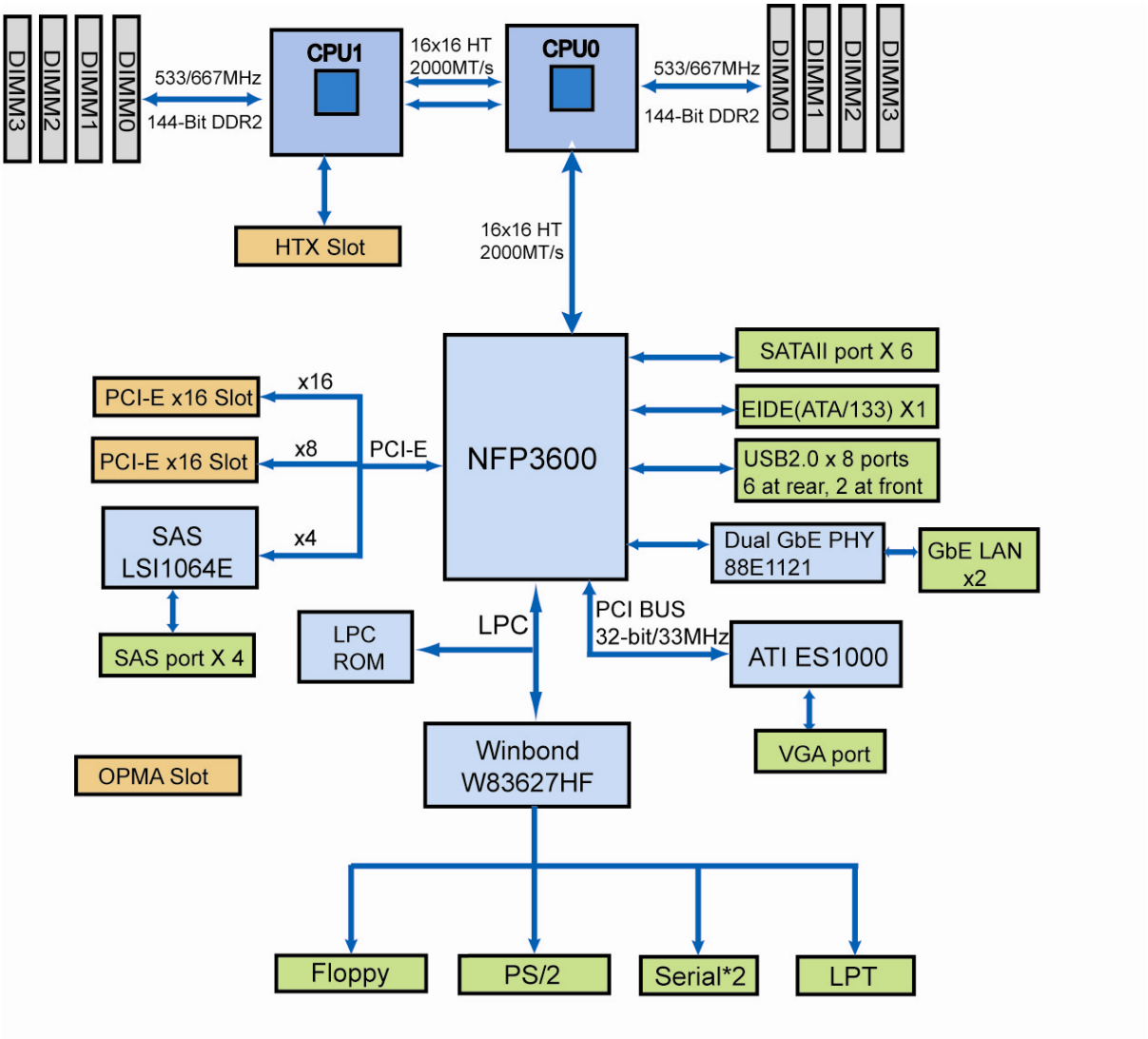
2.1- Board Image

This picture is representative of the latest board revision available at the time of publishing. The board you receive may or may not look exactly like the above picture.

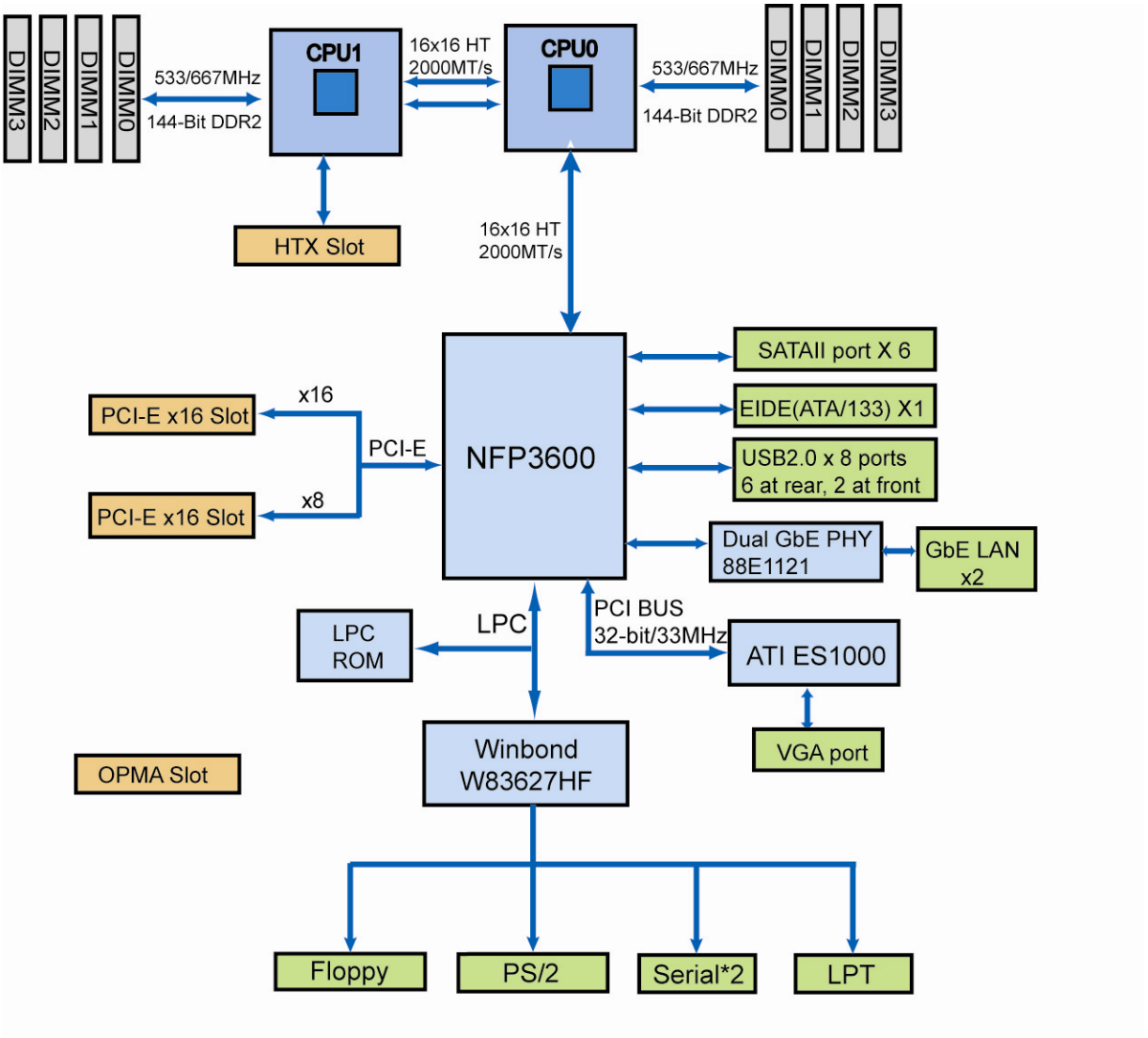

GUID LABEL
TIGER S2912
CPU1
CPU2
Remove the cap ONLY when installing a CPU to protect the socket pins.
Replace the cap before returning the board to TYAN.

The following page includes details on the vital components of this motherboard.

2.2 - Block Diagram

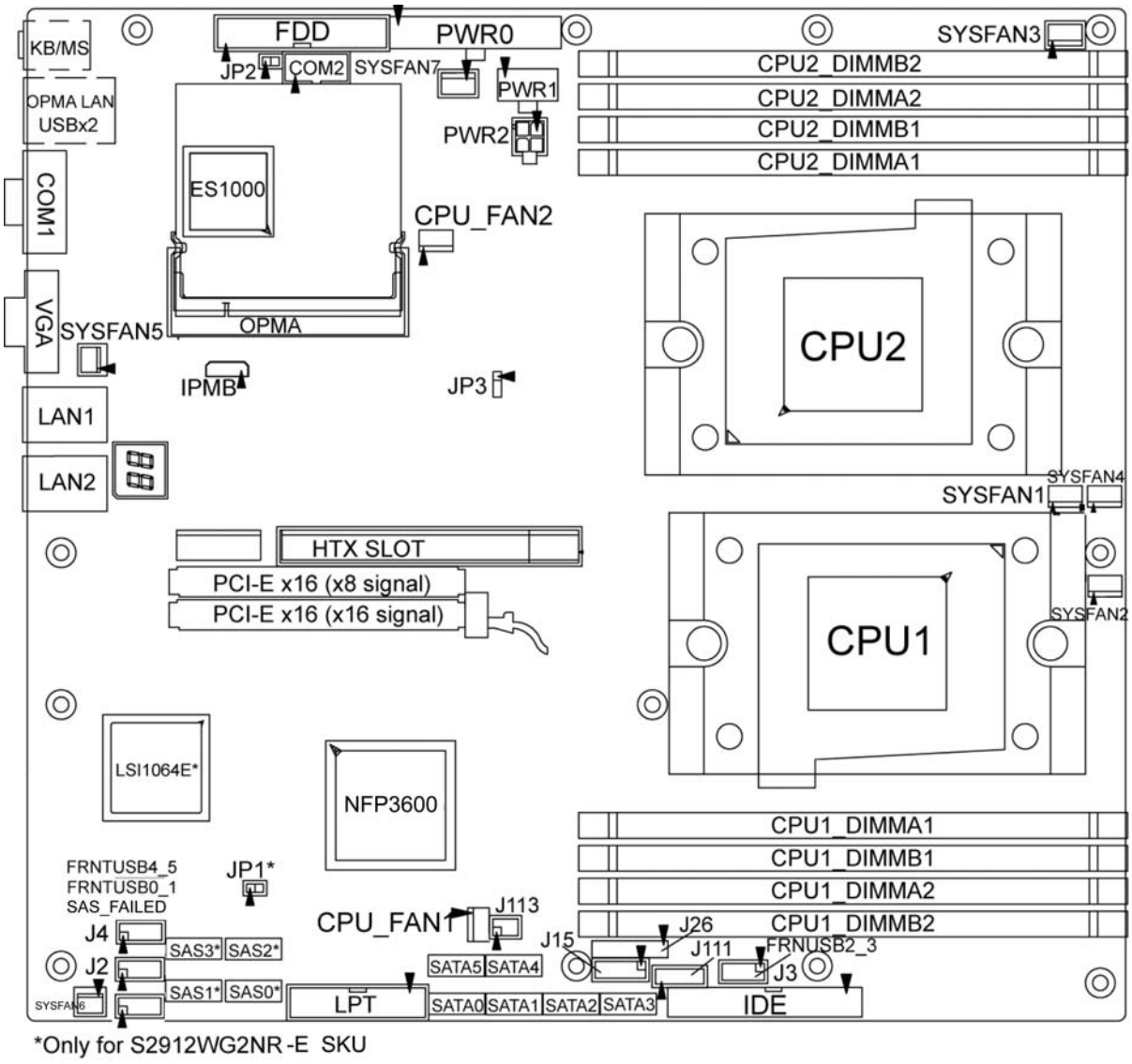


Thunder n3600R (S2912WG2NR-E) Block Diagram



Thunder n3600R (S2912G2NR-E) Block Diagram

2.3 - Board Parts, Jumpers and Connectors



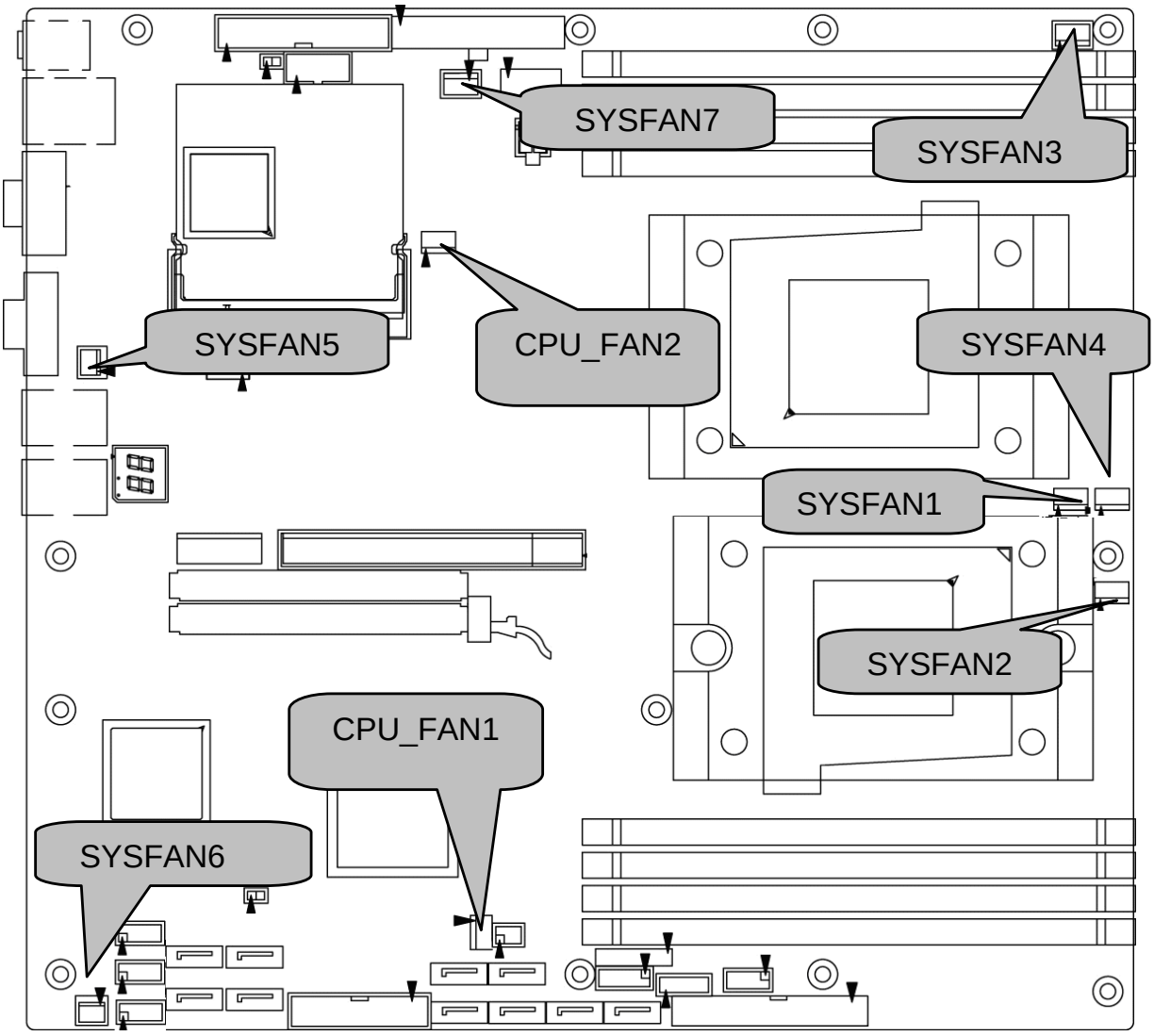
*Only for S2912WG2NR-E SKU

This diagram is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above diagram.

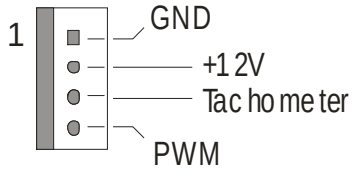
Jumper Legend

	OPEN - Jumper OFF, without jumper covered
	CLOSED – Jumper ON, with jumper covered

Jumper/Connector	Function
CPU_FAN1/CPU_FAN2	CPU FAN Connector
SYSFAN1/2/3/4/5/6/7	FAN Connector
IPMB (J14)	IPMB Connector
COM2 (J95)	COM2 Header
FRNTUSB0_1 (J2) FRNTUSB2_3 (J3) FRNTUSB4_5 (J4)	USB Pin Header
J26 (TYFP)	Front Panel Header
J113	LCD Model Pin Header
JP1*	SAS Disable Jumper (for S2912WG2NR-E only)
JP2	OPMA Card Select Jumper
JP3	Clear CMOS Jumper
J15/J111	Reserved for Barebone


SYSFAN7
SYSFAN3
SYSFAN5
CPU_FAN2
SYSFAN4
SYSFAN1
SYSFAN2
CPU_FAN1
SYSFAN6

CPU_FAN1/2 and SYSFAN1/2/3/4: 4-pin Fan Connector with Speed Control

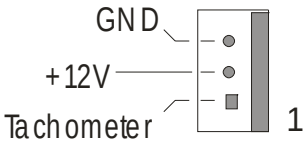


Use these headers to connect the cooling fans to the motherboard to keep the system stable and reliable.

This connector supports the tachometer monitoring and auto fan speed control.

Pin 1	Pin 2	Pin 3	Pin 4
GND	+12V	Tachometer	PWM

SYSFAN5/6: 3-pin Fan Connector

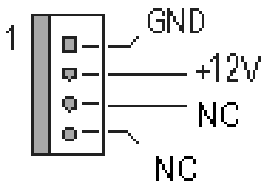


Use these headers to connect the cooling fans to the motherboard to keep the system stable and reliable.

This connector supports the tachometer monitoring.

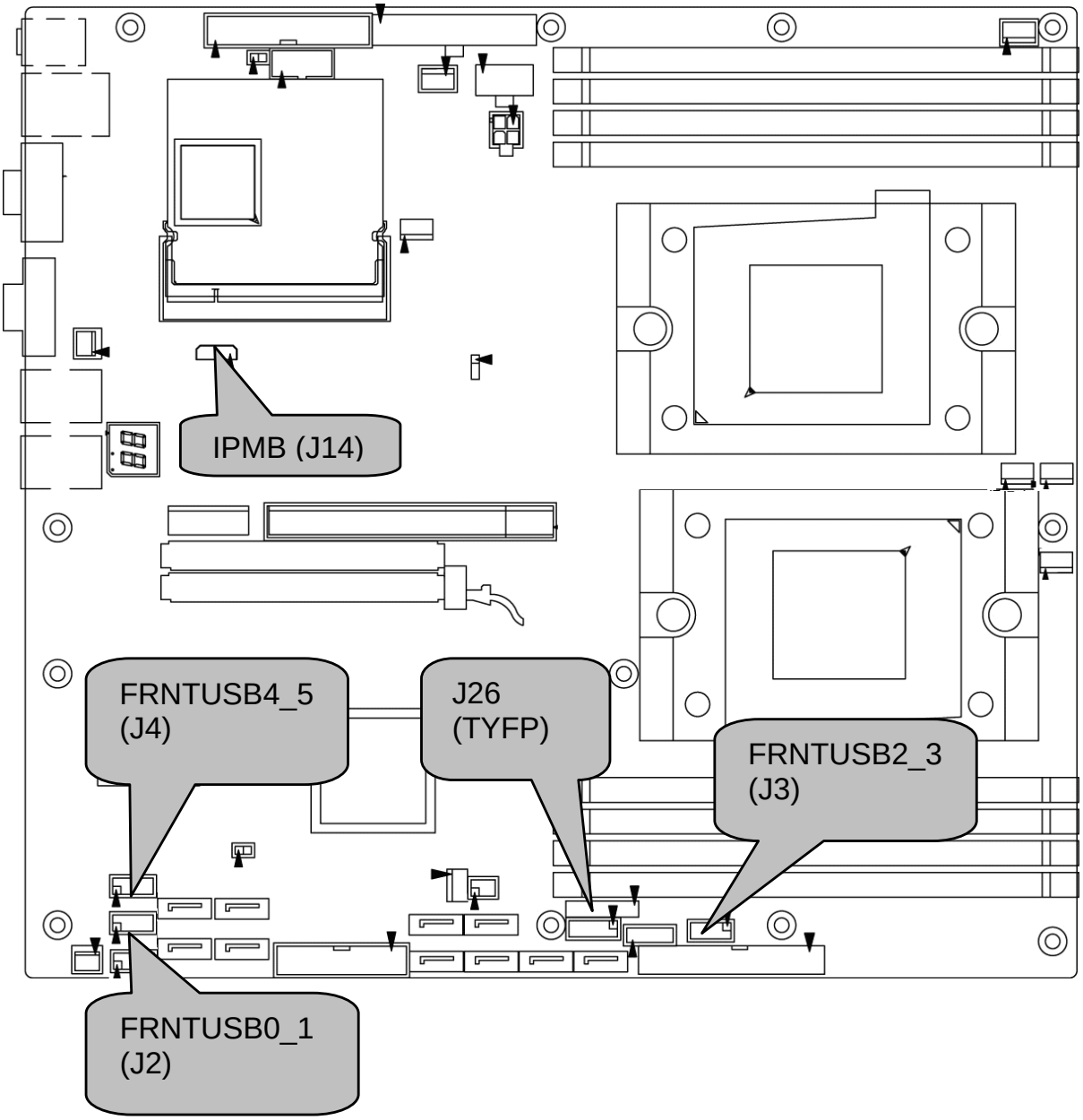
Pin 1	Pin 2	Pin 3
Tachometer	+12V	GND

SYSFAN7: 4-pin CPU Fan Connector

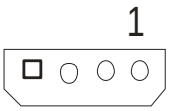


Use these headers to connect cooling fans to the motherboard to keep the system stable and reliable.

Pin 1	Pin 2	Pin 3	Pin 4
GND	+12V	NC	NC

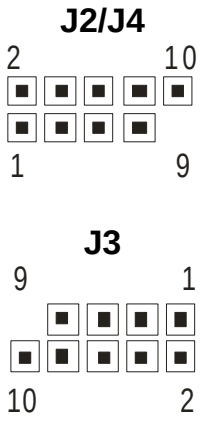

IPMB (J14)
FRNTUSB4_5
(J4)
J26
(TYFP)
FRNTUSB2_3
(J3)
FRNTUSB0_1
(J2)

IPMB (J14): IPMB Connector



Pin 1	IPMB DATA	Pin 2	GND
Pin 3	IPMB CLK	Pin 4	NC

J2/J3/J4: USB Front Panel Header

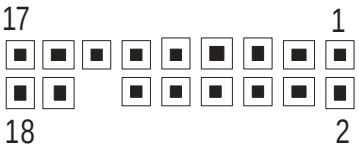


Use this header to connect to front panel USB connector.

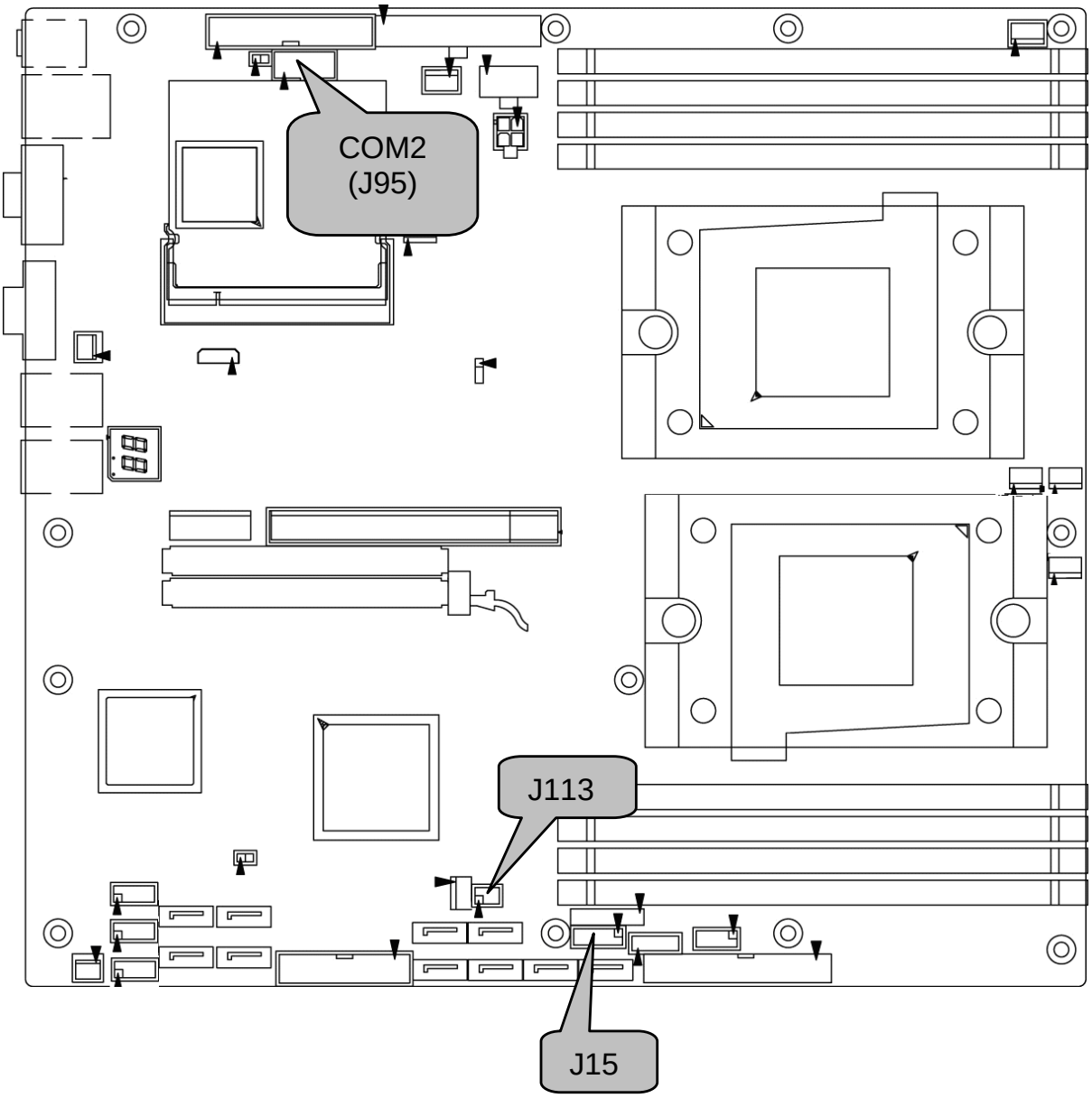
Signal	Pin	Pin	Signal
VCC	1	2	VCC
DATA-	3	4	DATA-
DATA+	5	6	DATA+
GND	7	8	GND
KEY	9	10	NA

J26 (TYFP): Front Panel Header

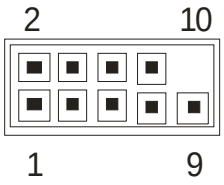
The motherboard provides one front panel header for electrical connection to the front panel switches and LED's.



SMBUIS_CLK	SMBUS_DATA	VDD_5_STBY	EXT_NMI_BTN_L	VCC	Reset SW-	Reset SW+	HDD LED-	HDD LED+
17	15	13	11	9	7	5	3	1
18	16	14	12	10	8	6	4	2
INTRUDER_L	GND	Key	GND	FAULT_LED_L_L	PWR SW-	PWR SW+	Power LED-	Power LED+


COM2
(J95)
J113
J15

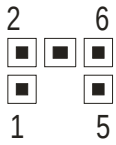
COM2 (J95): COM2 Header



Use these pin definitions to connect a port to COM2.
*TYAN does not provide cable for this header. It is designed for OEM use only.

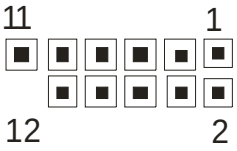
Pin	Signal	Pin	Signal
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	NA

J113: LCD Model Pin Header



Pin	Signal	Pin	Signal
1	+5V	2	SIN
3	Key	4	GND-
5	+5Vsb	6	SOUT

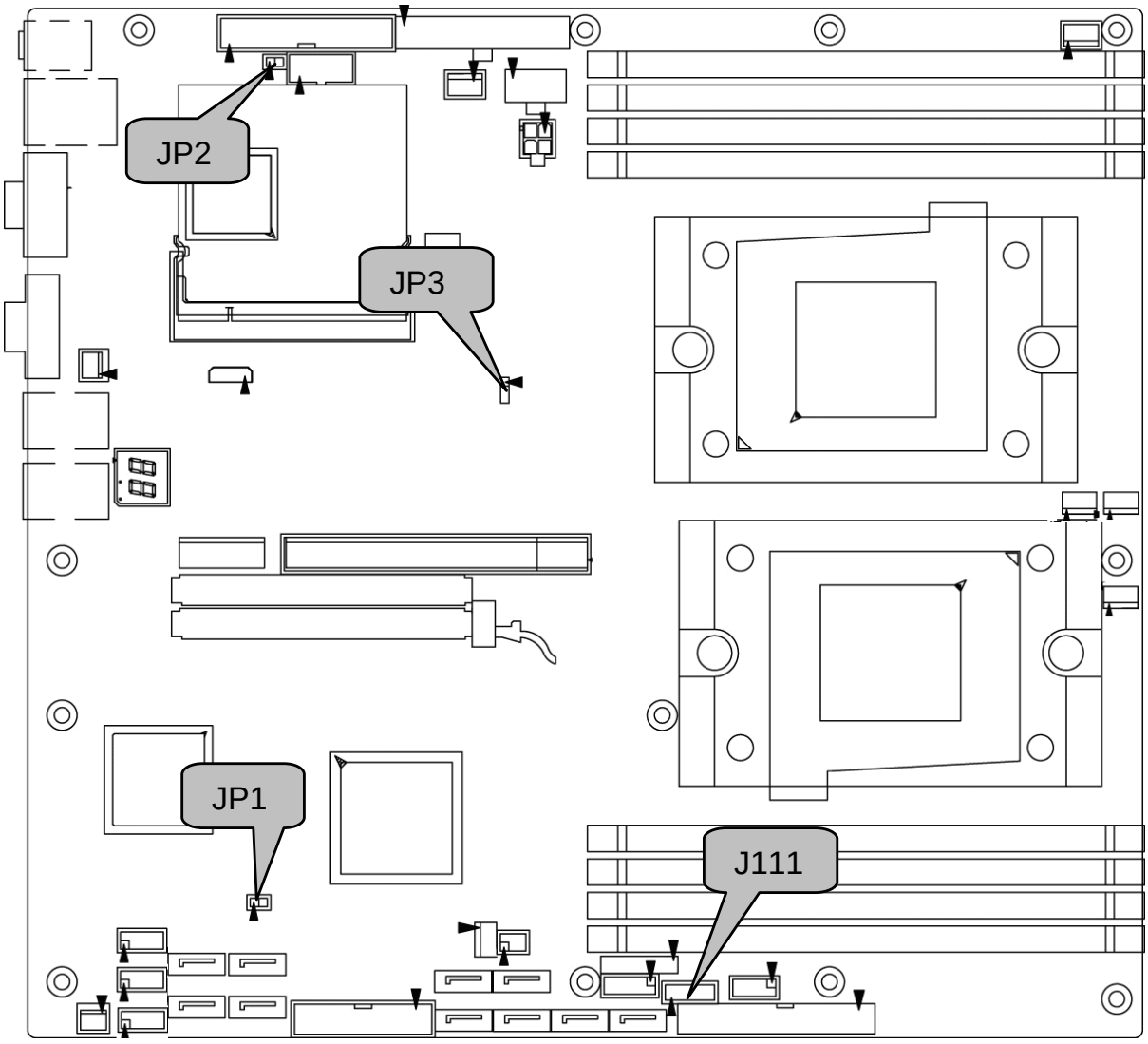
J15: TYAN Front Panel 2 for Barebone (reserved)



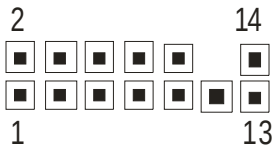
Pin	Signal	Pin	Signal
1	VDD_3P3_DUAL	2	P0_LED
3	VDD_3P3_DUAL	4	P1_LED
5	VDD_3P3_DUAL	6	M_LAN_ACT_L
7	FP_ID_LED_PW	8	GND
9	IDLED_IN	10	GND
11	NC	12	KEY

FP_ID_LED_PW: Use to turn on and turn off ID LED

IDLED_IN: Use to help identify a system for servicing when it is installed within a high density rack or cabinet that is populated with several other similar systems. The first press of the ID Switch will turn on the LED, and the second press will turn off ID LED.


JP2
JP3
JP1
J111

J111: Fan Connector for Barebone (reserved)



Pin	Signal	Pin	Signal
1	CPUFAN0_TACH	2	CPUFAN2_TACH
3	CPUFAN1_TACH	4	CPUFAN3_TACH
5	SYSFAN0_TACH	6	CPU_FAN_TACH2
7	SYSFAN1_TACH	8	SYSFAN5_TACH
9	NC	10	NC
11	GND	12	KEY
13	GND	14	CPUFAN0_PWM

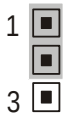
JP1: SAS Disable Jumper (for S2912WG2NR-E only)

	Open: Enable SAS Controller (Default)
	Closed: Disable SAS Controller

JP2: OPMA Card Supporting Select Jumper

	Open: Use other OPMA card
	Closed: Use TYAN OPMA card (Default)

JP3: Clear CMOS Jumper

 **Normal (Default)**	Use this jumper when you have forgotten your system/setup password or need to clear the system BIOS settings. How to clear the CMOS data - Power off system and **disconnect the power supply from the AC source** - Use jumper cap to close Pin 2 and 3 for several seconds to Clear CMOS - Replace jumper cap to close Pin 1 and 2 Reconnect the power supply to the AC source - Power on system
Clear	

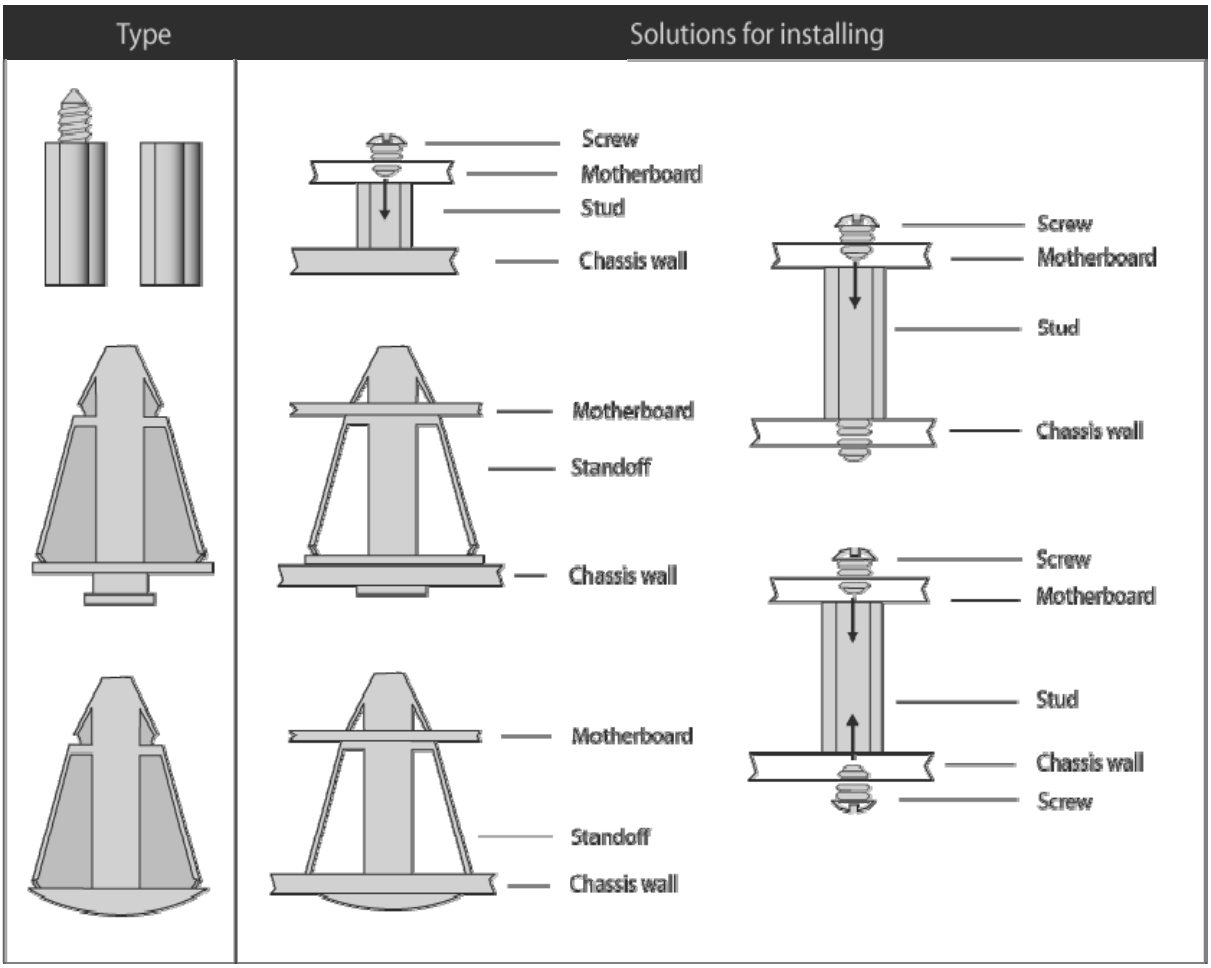
2.4 - Tips on Installing Motherboard in Chassis

Before installing your motherboard, make sure your chassis has the necessary motherboard support studs installed. These studs are usually metal and are gold in color. Usually, the chassis manufacturer will pre-install the support studs. If you are unsure of stud placement, simply lay the motherboard inside the chassis and align the screw holes of the motherboard to the studs inside the case. If there are any studs missing, you will know right away since the motherboard will not be able to be securely installed.

Some chassis' include plastic studs instead of metal. Although the plastic studs are usable, TYAN recommends using metal studs with screws that will fasten the motherboard more securely in place.

Below is a chart detailing what the most common motherboard studs look like and how they should be installed.

Mounting the Motherboard



2.5 - Installing the Processor(s)

Your S2912-E supports the latest processor technologies from AMD. Check the TYAN website for latest processor support:

http://www.tyan.com

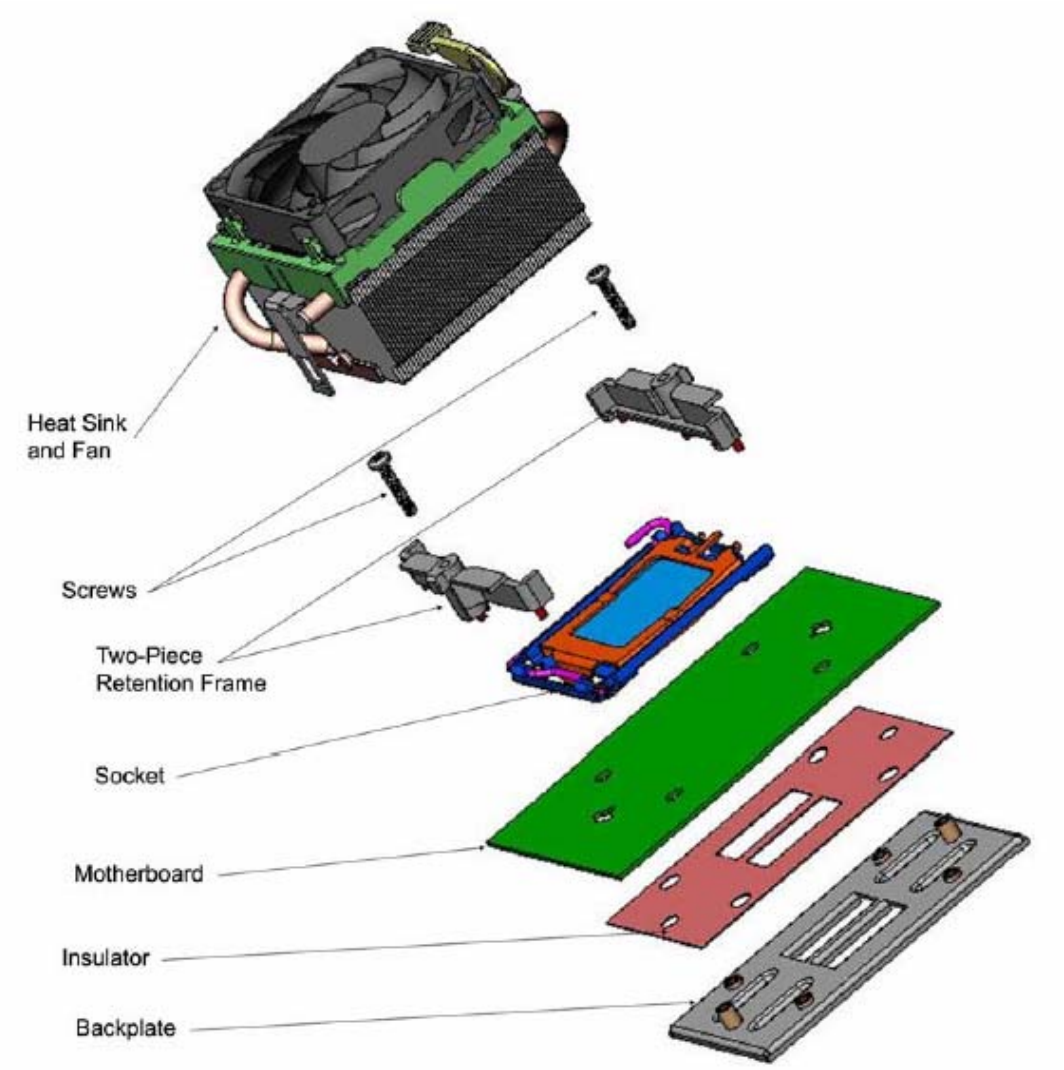


Figure 1. Detailed View of the Thermal Solution AMD PIB Platforms based on the AMD Socket F Processor

Back plate Assembly

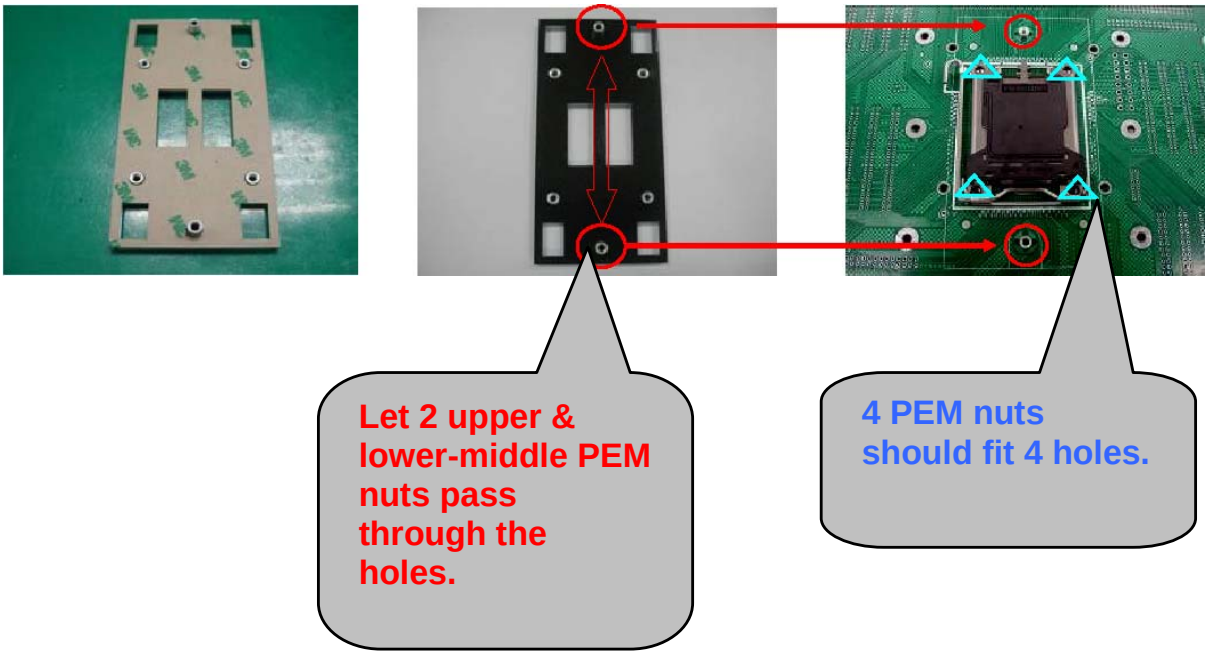
S2912-E follows AMD 1U/2S CPU keep out zoon spec, please use 1U RevF back plate on S2912-E, the distance of two mounting hole use to lock the CPU heatsink is 4.1 inch. The back plate is mounted on the backside of the motherboard and enhances local stiffness to support shock and vibration loads acting on the heat sink. The back plate assembly prevents excessive motherboard stress in the area near the processor. Without a back plate, excessive stress could cause serious damage to electrical connections of the processor socket and integrated circuit packages surrounding the processor. The back plate also serves as a reinforcement plate for the LGA socket.

While doing the installation, be careful in holding the components. Follow these instructions to install your back plate:

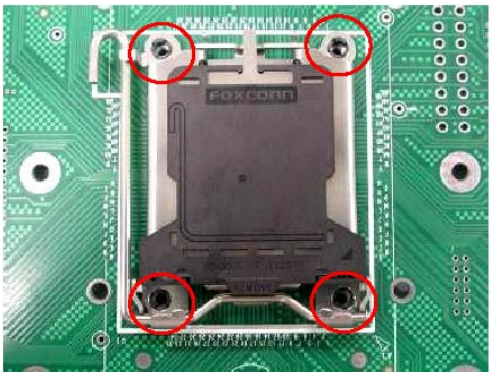
1. Remove the release liner from the back plate.

2. Align the PEM nuts on the back plate to the holes on the reverse side of the PCB.

3. First, insert the taller upper & lower middle PEM nuts through the holes of the PCB. The remaining four shorter PEM nuts should automatically fit the 4 holes on the PCB as shown in the following pictures.

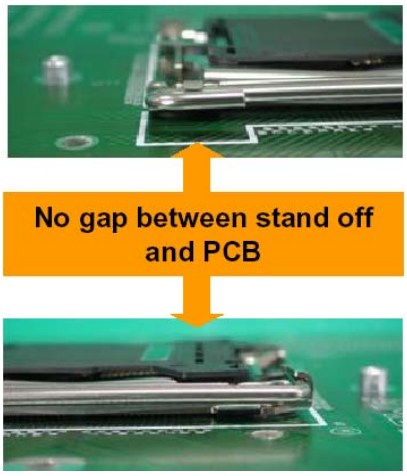


4. Locate four screw holes on socket and screw the socket to the PCB board.



NOTE: Do not assemble CPU before securing socket with screws.

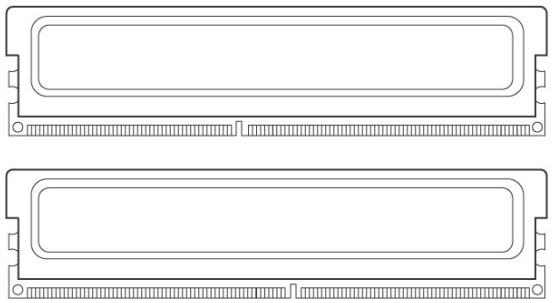
5. Inspect Socket F assembly to PCB. The Socket F must be tightly attached onto the PCB. There must NOT be any gap between stand off the PCB.



2.6 - Installing the Memory

Before installing memory, ensure that the memory you have is compatible with the motherboard and processor. Only DDR2-400/533/667 DIMM modules are required. Check the TYAN Web site at: **www.tyan.com** for details of the type of memory recommended for your motherboard.

The following diagram shows common types of DDR2 memory modules.



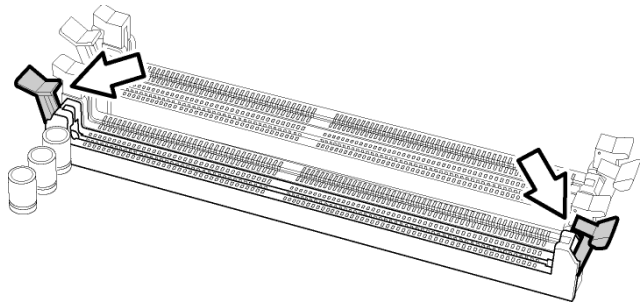
Key points to note before installing memory:

- Only **DDR2 400/533 /667 Registered ECC** memory modules are supported.
- All installed memory will automatically be detected and no jumpers or settings need changing.

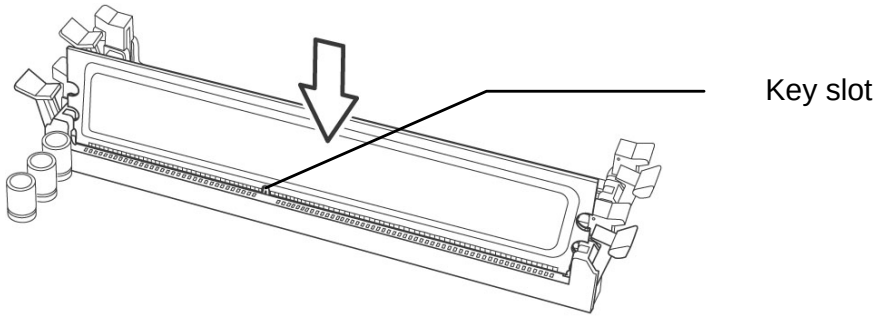
Memory Installation Procedure

Follow these instructions to install memory modules into the S2912-E.

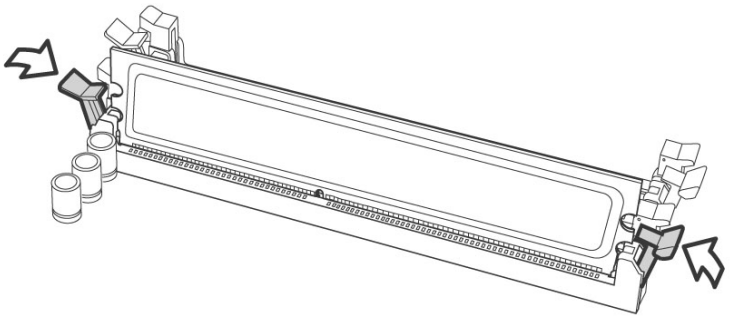
1. Press the locking levers in the direction shown in the following illustration.



2. Align the memory module with the socket. The memory module is keyed to fit only one way in the socket.



3. Seat the module firmly into the socket by gently pressing down until it sits flush with the socket. The locking levers pop up into place.



Key points to note before installing memory into Thunder n3600R:

For optimal dual-channel DDR2 operation, always install memory in pairs beginning with outer most dimm slots CPU1 DIMMA2 and CPU1_ DIMMB2. Memory modules of the same type and density are required for dual-channel DDR2 operation. Mismatched memory may cause system instability.

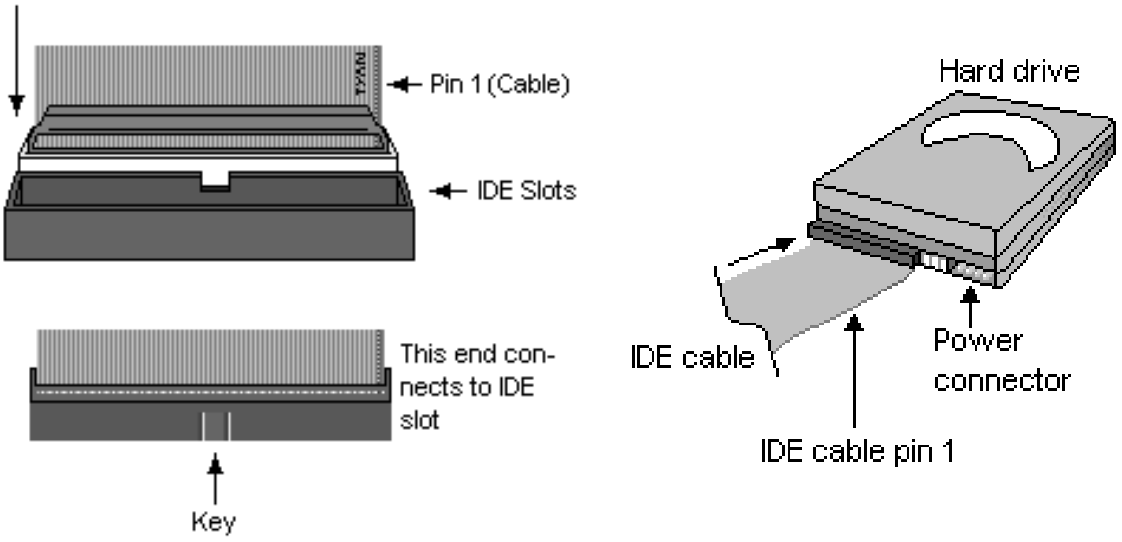
Refer to the following table for supported DDR2 populations.
(Note: X indicates a populated DIMM slot)

	Single CPU Installed (CPU1 only)		Dual CPU installed (CPU1 and CPU2)	
Population Option	1	2	3	4
CPU1_DIMMA1		x		x
CPU1_DIMMB1		x		x
CPU1_DIMMA2	x	x	x	x
CPU1_DIMMB2	x	x	x	x
CPU2_DIMMA1				x
CPU2_DIMMB1				x
CPU2_DIMMA2			x	x
CPU2_DIMMB2			x	x

2.7 - Attaching Drive Cables

Attaching IDE Drive Cable
Attaching the IDE drive cable is simple. The cable is “keyed” to only allow it to be connected in the correct manner.

Attaching IDE cable to the IDE connector is illustrated below:



Simply plug in the BLUE END of the IDE cable into the motherboard IDE connector, and the other end into the drive. Each standard IDE cable has three connectors, two of which are closer together. The BLUE connector that is furthest away from the other two is the end that connects to the motherboard. The other two connectors are used to connect to drives.

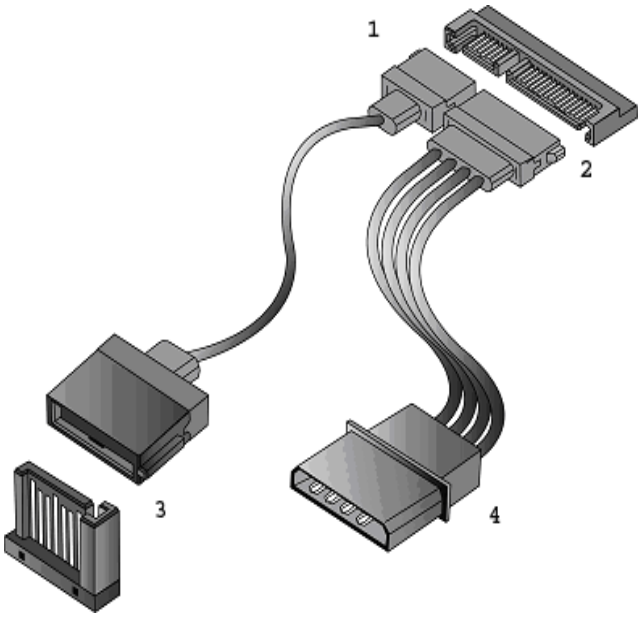
Note: Always remember to properly set the drive jumpers. If only using one device on a channel, it must be set as Master for the BIOS to detect it.

TIP: Pin 1 on the IDE cable (usually designated by a colored wire) faces the drive’s power connector.

Attaching Serial ATA Cables
The Thunder n3600R is also equipped with 6 Serial ATA (SATA) channels. Connections for these drives are also very simple.

There is no need to set Master/Slave jumpers on SATA drives.

The following pictures illustrate how to connect an SATA drive



1.SATA drive cable connection

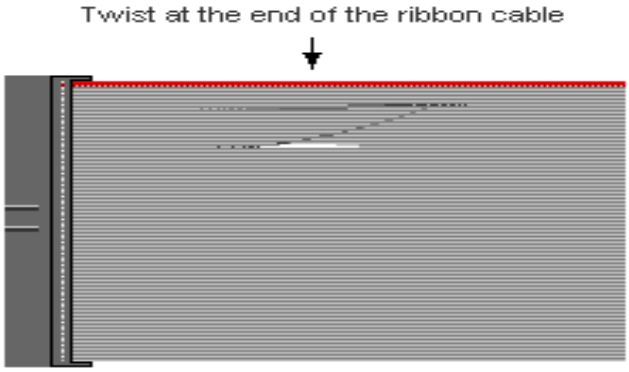
2. SATA drive power connection

3. SATA cable motherboard connector

4. SATA drive power adapter

Attaching Floppy Drive Cables

Attaching floppy diskette drives are done in a similar manner to hard drives. See the picture below for an example of a floppy cable. Most of the current floppy drives on the market require that the cable be installed with the colored stripe positioned next to the power connector. In most cases, there will be a key pin on the cable which will force a proper connection of the cable.



Attach first floppy drive (drive **A:**) to the end of the cable with the twist in it. Drive **B:** is usually connected to the next possible connector on the cable (the second or third connector after you install Drive **A:**).

2.8 - Installing Add-In Cards

Before installing add-in cards, it's helpful to know if they are fully compatible with your motherboard. For this reason, we've provided the diagrams below, showing the most common slots that may appear on your motherboard. Not all of the slots shown will necessarily appear on your motherboard.

PCI Express X16 Slot with x16 signal

PCI Express X16 Slot with x8 signal

HTX-pro Connector
Supports Pathscale InfiniPath HTX Adapter

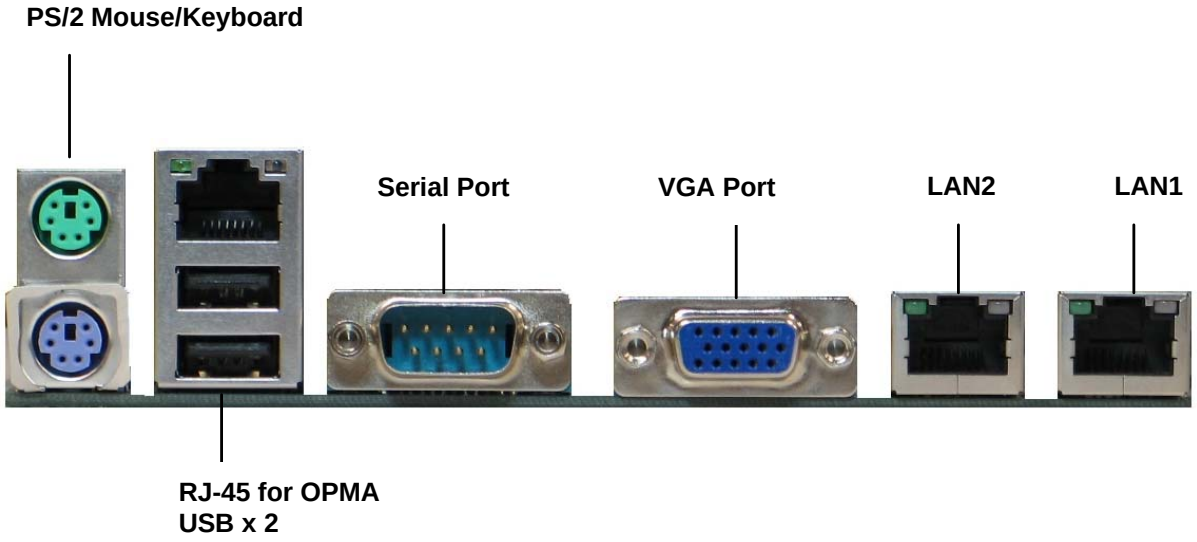
Simply find the appropriate slot for your add-in card and insert the card firmly. Do not force any add-in cards into any slots if they do not seat in place. It is better to try another slot or return the faulty card rather than damaging both the motherboard and the add-in card.

NOTE

YOU MUST ALWAYS unplug the power connector from the motherboard before performing system hardware changes. Otherwise you may damage the board and/or expansion device.

2.9 - Connecting External Devices

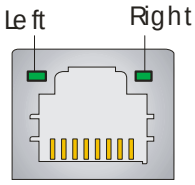
Your motherboard supports a number of different interfaces for connecting peripherals. Some I/O ports may not be available with the board due to the different configurations.



Peripheral devices can be plugged straight into any of these ports but software may be required to complete the installation.

LAN LED Color Definition

The onboard Ethernet port has green and yellow LEDs to indicate LAN status. The chart below illustrates the different LED states.

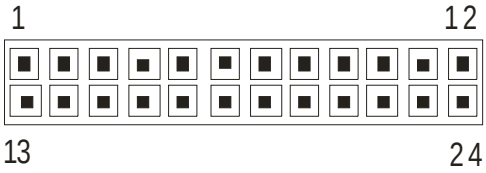


Description	Left LED	Right LED
No Link	OFF	OFF
Link 10Mbps	GREEN	OFF
Activity 10Mbps	GREEN(blink)	Green
Linked at 100Mbps	Green	Green
Activity 100Mbps	Green(blink)	Green(blink)
Linked at 1000Mbps	OFF	Green
Activity 1000Mbps	OFF	Green(blink)

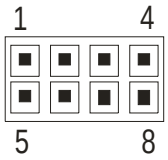
2.10- Installing the Power Supply

There are three power connectors on your Thunder n3600R.
The Thunder n3600R requires an EPS12V (24 pin + 8 pin +4 pin) power supply.
All the three power connectors must be installed in order to boot up the system.

Please be aware that ATX 2.x and ATXGES power supplies are **not compatible** with the board and can damage the motherboard and/or CPU(s).



12	+3.3V	24	GND
11	+12V1	23	+5V
10	+12V1	22	+5V
9	+5VSB	21	+5V
8	PWR OK	20	RESVD
7	GND	19	GND
6	+5V	18	GND
5	GND	17	GND
4	+5V	16	PSON#
3	GND	15	GND
2	+3.3V	14	-12V
1	+3.3V	13	+3.3V



EPS 12V 8-pin (CPU Power)

4	GND	8	+12V2
3	GND	7	+12V2
2	GND	6	+12V2
1	GND	5	+12V2

4	+12V3
3	+12V3
2	GND
1	GND

Applying power to the board

1. Connect the EPS 12V 8-pin power connector.
2. Connect the EPS 12V 24-pin power connector.
3. Connect the EPS 12V 4-pin power connector.
4. Connect power cable to power supply and power outlet.

NOTE

YOU MUST unplug the power supply from the wall outlet before plugging the power cables to motherboard connectors.

2.11 – Finishing Up

Congratulations! You're finished setting up the hardware aspect of your computer. Before closing up your chassis, make sure that all cables and wires are connected properly, especially IDE cables and jumpers. You may have difficulty powering on your system if the motherboard jumpers are not set correctly.

In the rare circumstance that you have experienced difficulty, you can find help by asking your vendor for assistance. If they are not available for assistance, please find setup information and documentation online at our website or by **calling your vendor's support line.**

Chapter 3: BIOS

3.1 About the BIOS

The BIOS is the basic input/output system, the firmware on the motherboard that enables your hardware to interface with your software. This chapter describes different settings for the BIOS that can be used to configure your system.
The BIOS section of this manual is subject to change without notice and is provided for reference purposes only. The settings and configurations of the BIOS are current at the time of print, and therefore may not match exactly what is displayed on screen.
This section describes the BIOS setup program. The setup program lets you modify basic configuration settings. The settings are then stored in a dedicated, battery-backed memory (called NVRAM) that retains the information when the power is turned off.
This motherboard's BIOS is a customized version of the industry-standard BIOS for IBM PC AT-compatible personal computers. The BIOS provides critical, low-level support for the system's central processing unit (CPU), memory, and I/O subsystems.
This BIOS has been customized by adding important features such as virus and password protection, power management, and chipset "tuning" features that control the system. This section will guide you through the process of configuring the BIOS for your system setup.

Starting Setup

The BIOS is immediately activated when you turn on the computer. The BIOS reads system configuration in CMOS RAM and begins the process of checking out the system and configuring it through the Power-On-Self-Test (POST).
When these preliminary tests are complete, the BIOS searches for an operating system on one of the system's data storage devices (hard drive, CD-ROM, etc). If one is found, the BIOS will launch that operating system and hand control over to it.
You can enter the BIOS setup by pressing the [**Delete**] key when the machine boots up and begins to show the memory count.

Setup Basics
The table below shows how to use the setup program with the keyboard.

Key	Function
Tab	Moves from one selection to the next
Left/Right Arrow Keys	Changes from one menu to the next
Up/Down Arrow Keys	Moves between selections
Enter	Opens highlighted section
PgUp/PgDn Keys	Changes settings.

Getting Help

Pressing [**F1**] displays a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press [**ESC**] or the [**F1**] key again.

In Case of Problems

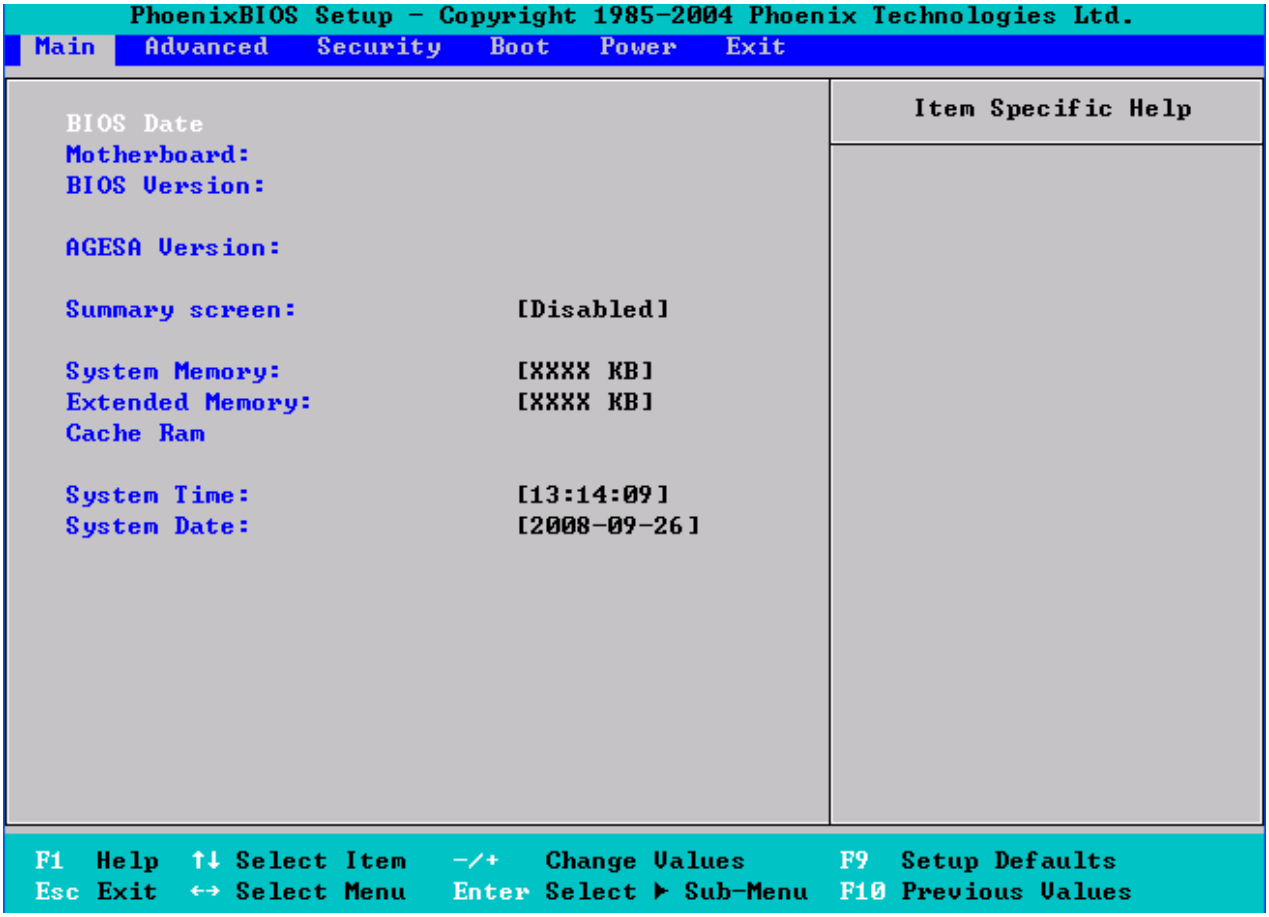
If you discover that you have trouble booting the computer after making and saving the changes with the BIOS setup program, restart the computer by holding the power button down until the computer shuts off (usually within 4 seconds); resetting by pressing CTRL-ALT-DEL; or clearing the CMOS.
The best advice is to only alter settings that you thoroughly understand. In particular, do not change settings in the Chipset section unless you are sure of the outcome. TYAN or your system manufacturer has carefully chosen the chipset defaults for best performance and reliability. Even a seemingly small change to the Chipset setup options may cause the system to become unstable or unusable.

Setup Variations

Not all systems have the same BIOS setup layout or options. While the basic look and function of the BIOS setup remains more or less the same for most systems, the appearance of your Setup screen may differ from the charts shown in this section. Each system design and chipset combination requires a custom configuration. In addition, the final appearance of the Setup program depends on the system designer. Your system designer may decide that certain items should not be available for user configuration, and remove them from the BIOS setup program.

3.2 Main BIOS Setup

When you enter PhoenixBIOS CMOS Setup Utility, the following screen will appear as below:



The main menu contains the following menu items:

Main
Use this menu for basic system configuration.

Advanced
Use this menu to set the Advanced Features available on your system.

Security
Use this menu to configure security settings for your system.

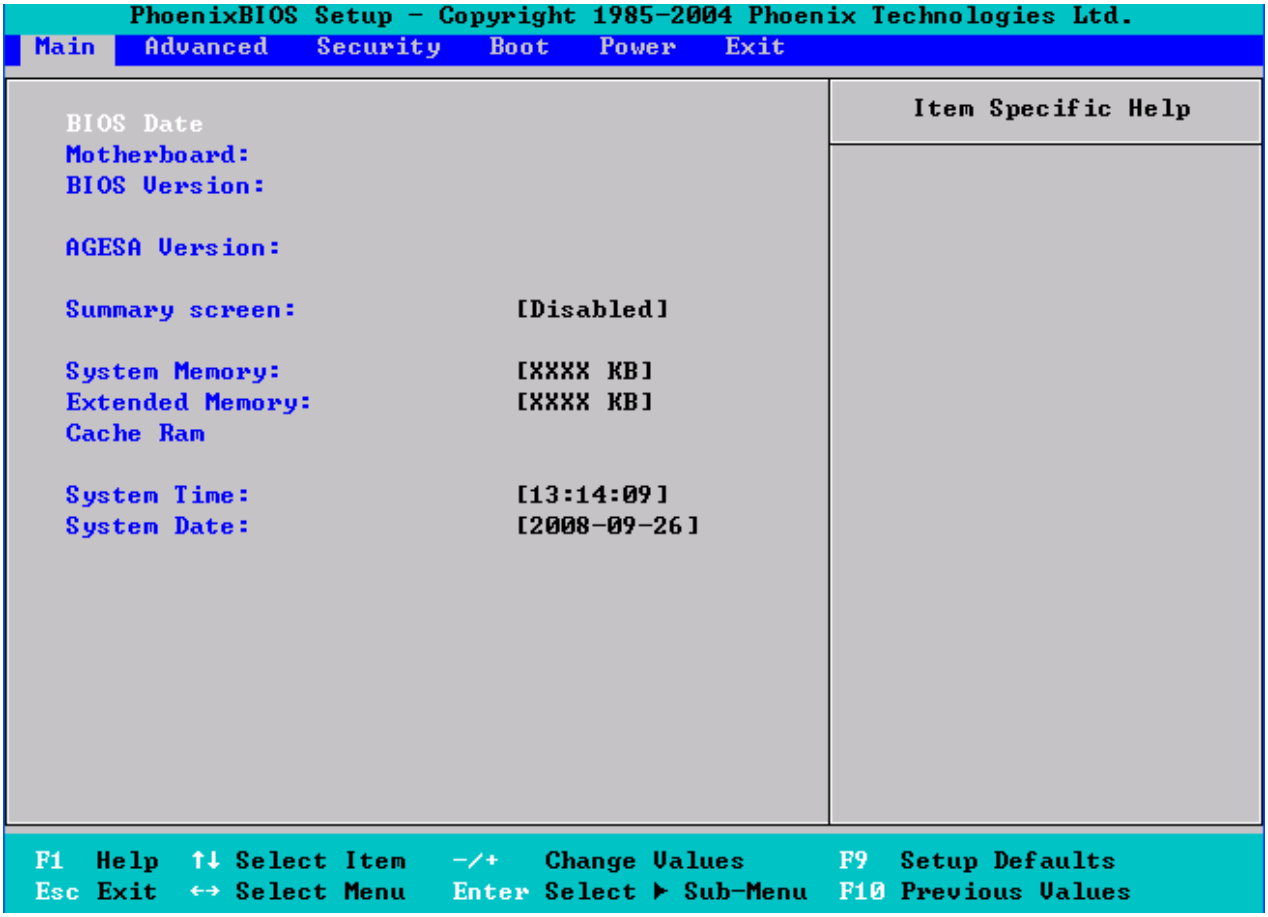
Boot
Use this menu to configure boot options for your system.

Power
Use this menu to specify your settings for power management.

Exit
This contains the various BIOS exit options.

3.3 Main

In this section, you can alter general features such as the date and time, as well as access to the IDE configuration options. Note that the options listed below are for options that can directly be changed within the Main Setup screen. Users use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.


PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Main Advanced Security Boot Power Exit
BIOS Date
Motherboard:
BIOS Version:
AGESA Version:
Summary screen: [Disabled]
System Memory: [XXXX KB]
Extended Memory: [XXXX KB]
Cache Ram
System Time: [13:14:09]
System Date: [2008-09-26]
Item Specific Help
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

BIOS Date
This shows the date that BIOS is created.

Motherboard
This shows the motherboard name.

BIOS Version
This shows the BIOS version.

AGESA Version
This shows AMD AGESA code version.

Summary Screen
This displays system configuration on boot.
Options: Enabled / **Disabled**

System Memory
This displays the amount of system memory present on the system.

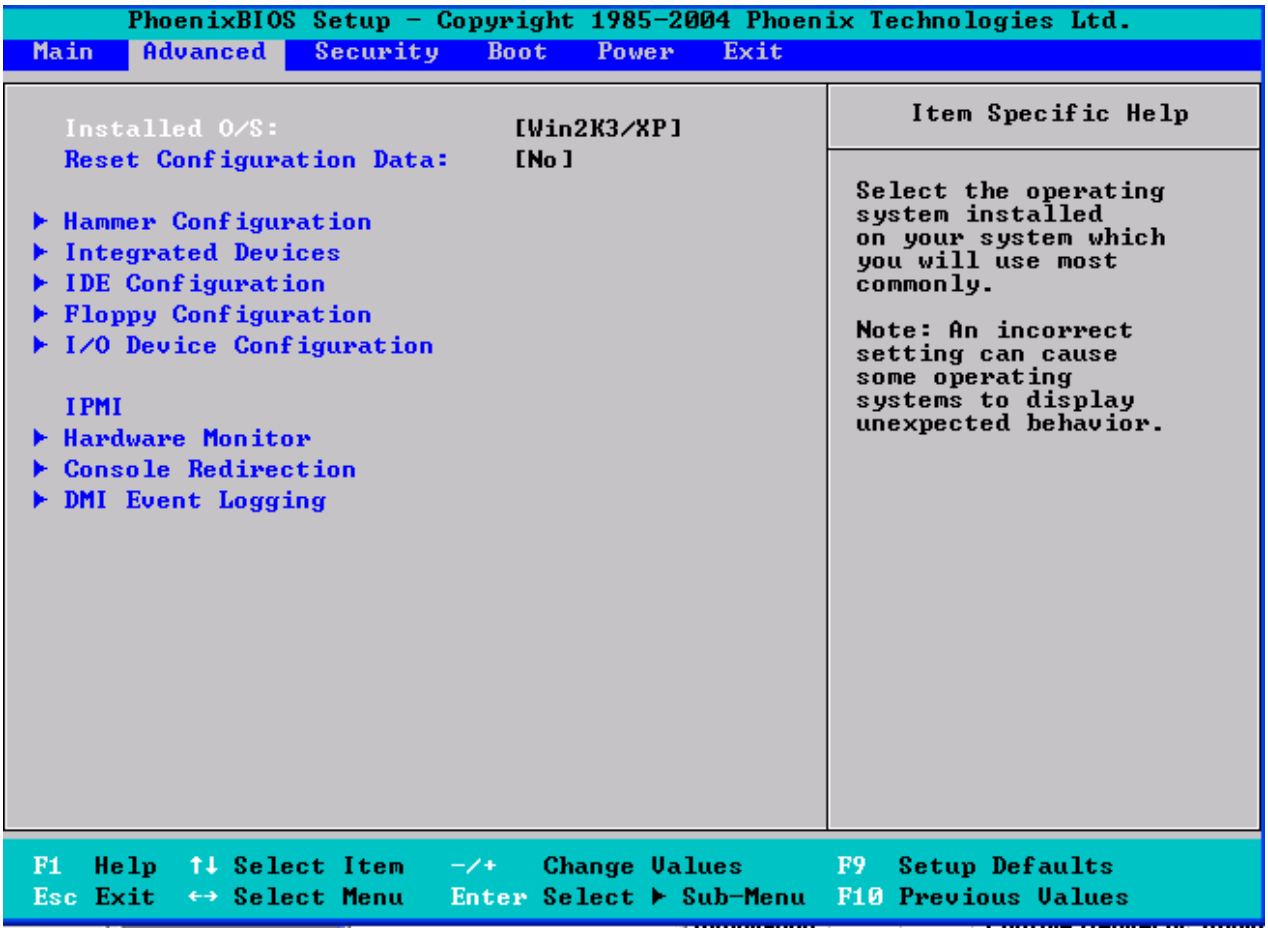
Extended Memory
This displays the amount of extended memory present on the system.

Cache Ram
This displays the amount of cache memory present on the system.

System Time / System Date
System Time: Adjusts the system clock.
HHHours (24hr. format): MMMinutes : SSSeconds
System Date: Adjusts the system date.
MMMonths : DDDays : YYYYYears

3.4 Advanced

This section facilitates configuring advanced BIOS options for your system.


PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Main
Advanced
Security
Boot
Power
Exit
Installed O/S: [Win2K3/XP]
Reset Configuration Data: [No]
Hammer Configuration
Integrated Devices
IDE Configuration
Floppy Configuration
I/O Device Configuration
IPMI
Hardware Monitor
Console Redirection
DMI Event Logging
Item Specific Help
Select the operating system installed on your system which you will use most commonly.
Note: An incorrect setting can cause some operating systems to display unexpected behavior.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Installed O/S

This allows you to select the operating system installed on your system which you will use most commonly.

NOTE: An incorrect setting can cause the operating system to behave unpredictably.

Options: Other / Win95 / Win98 / WinMe / **WinXP64**

Reset Configuration Data

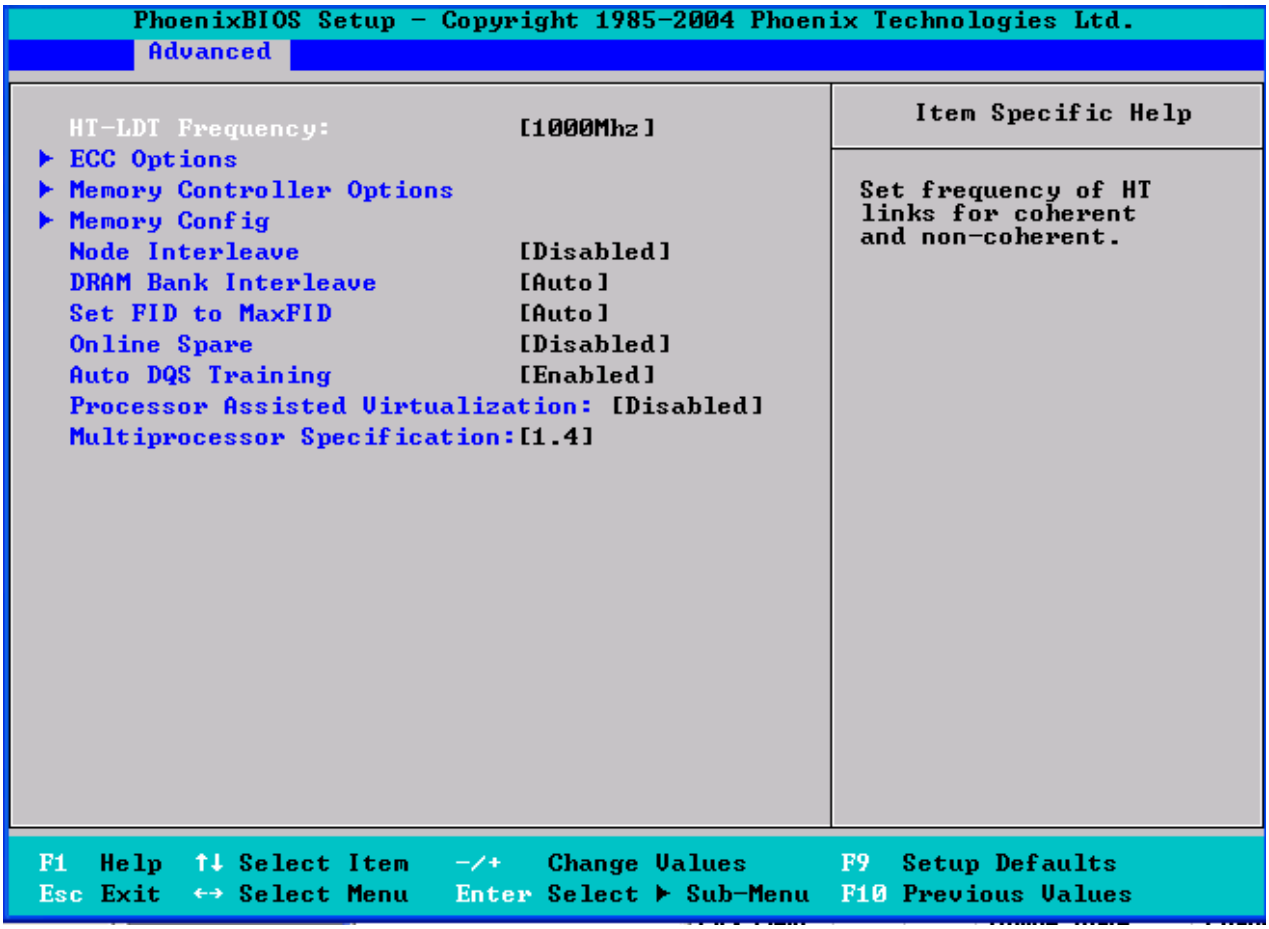
If you install a new piece of hardware or modify your computer's hardware configuration, the BIOS will automatically detect the changes and reconfigure the ESCD (Extended System Configuration Data). Therefore, there is usually no need to manually force the BIOS to reconfigure the ESCD.

Select [Yes] if you want to clear the ESCD area.

Options: Yes / **No**

3.4.1 Hammer Configuration

This section allows you to fine tune the hammer configuration.


PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Advanced
HT-LDT Frequency: [1000Mhz]
ECC Options
Memory Controller Options
Memory Config
Node Interleave [Disabled]
DRAM Bank Interleave [Auto]
Set FID to MaxFID [Auto]
Online Spare [Disabled]
Auto DQS Training [Enabled]
Processor Assisted Virtualization: [Disabled]
Multiprocessor Specification: [1.4]
Item Specific Help
Set frequency of HT links for coherent and non-coherent.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

HT-LDT Frequency

The port's transmission frequency.

Options: **1000MHz** / 800MHz / 600MHz / 400MHz / 200MHz

Node Interleave

Interleave memory blocks across nodes. Auto will set this enabled when possible.

Options: **Disabled** / Auto

DRAM Bank Interleave

Interleave memory blocks across the DRM chip selects. Auto will set this enabled when possible.

Options: **Auto** / Disabled

Set FID to MaxFID

Enable this option to set the FID to MaxFID on fused, non-server parts. It also sets the VID to 50mV less than the MaxFID. Disable this option to leave the FID alone. For unfused parts or server parts, enabled will do nothing.

Options: **Auto** / Disabled

Online Spare

Enable the DRAM controller to designate a DIMM bank as a spare for logical swap during runtime.

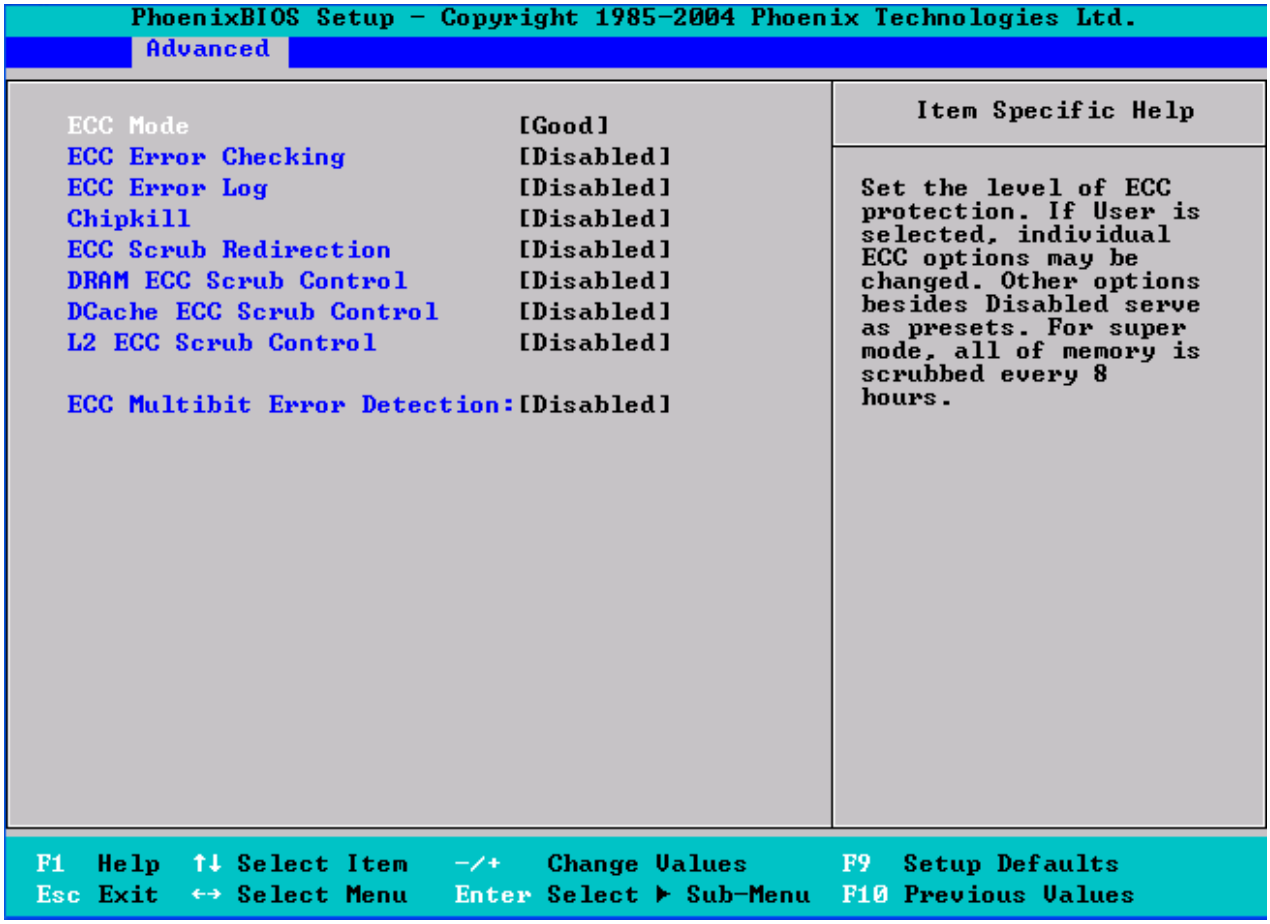
Options: **Disabled** / Enabled

Auto DQS Training
[Disabled]: Do DQS training on every cold boot.
[Enabled]: Train DQS only when the installed DIMMs are changed.
Options: **Enabled** / Disabled

Processor Assisted Virtualization
Enable the hardware virtualization support.
Options: **Disabled** / Enabled

Multiprocessor Specification
It allows you to configure the MP specification revision level. Some operating systems will require 1.1 for compatibility reasons.
Options: **1.4** / 1.1

3.4.1.1 ECC Options Sub-Menu


PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Advanced
ECC Mode [Good]
ECC Error Checking [Disabled]
ECC Error Log [Disabled]
Chipkill [Disabled]
ECC Scrub Redirection [Disabled]
DRAM ECC Scrub Control [Disabled]
DCache ECC Scrub Control [Disabled]
L2 ECC Scrub Control [Disabled]
ECC Multibit Error Detection: [Disabled]
Item Specific Help
Set the level of ECC protection. If User is selected, individual ECC options may be changed. Other options besides Disabled serve as presets. For super mode, all of memory is scrubbed every 8 hours.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

ECC Mode
Set the level of ECC protection. If User is selected, individual ECC options may be changed. Other options besides Disabled serve as presets. For super mode, all of memory is scrubbed every 8 hours.
Options: Disabled / Basic / **Good** / Super / Max / User

ECC Error Checking

Enable the DRAM controller to read/write ECC check-bits on the DIMMs and it allows the north bridge to check and correct ECC errors on the DRAM bus during normal CPU or bus master read requests.
Options: **Disabled** / Enabled

ECC Error Log
Enable the MCA to log or report ECC errors on the DRAM bus.
NOTE: The MCA must still be programmed according to the desired MCE outcome.
Options: **Disabled** / Enabled

Chipkill
Enable 4-bit ECC mode<Chipkill> on dram controllers with all x4 ECC capable DIMMs. Setting to Auto will enable 4-bit ECC mode only when memory is configured for 128-bit operations.
Options: **Disabled** / Enabled

ECC Scrub Redirection
Enable the northbridge to force a write to DRAM with corrected data when a correctable error on the DRAM bus is detected during a normal CPU or bus master read request.
Options: **Disabled** / Enabled

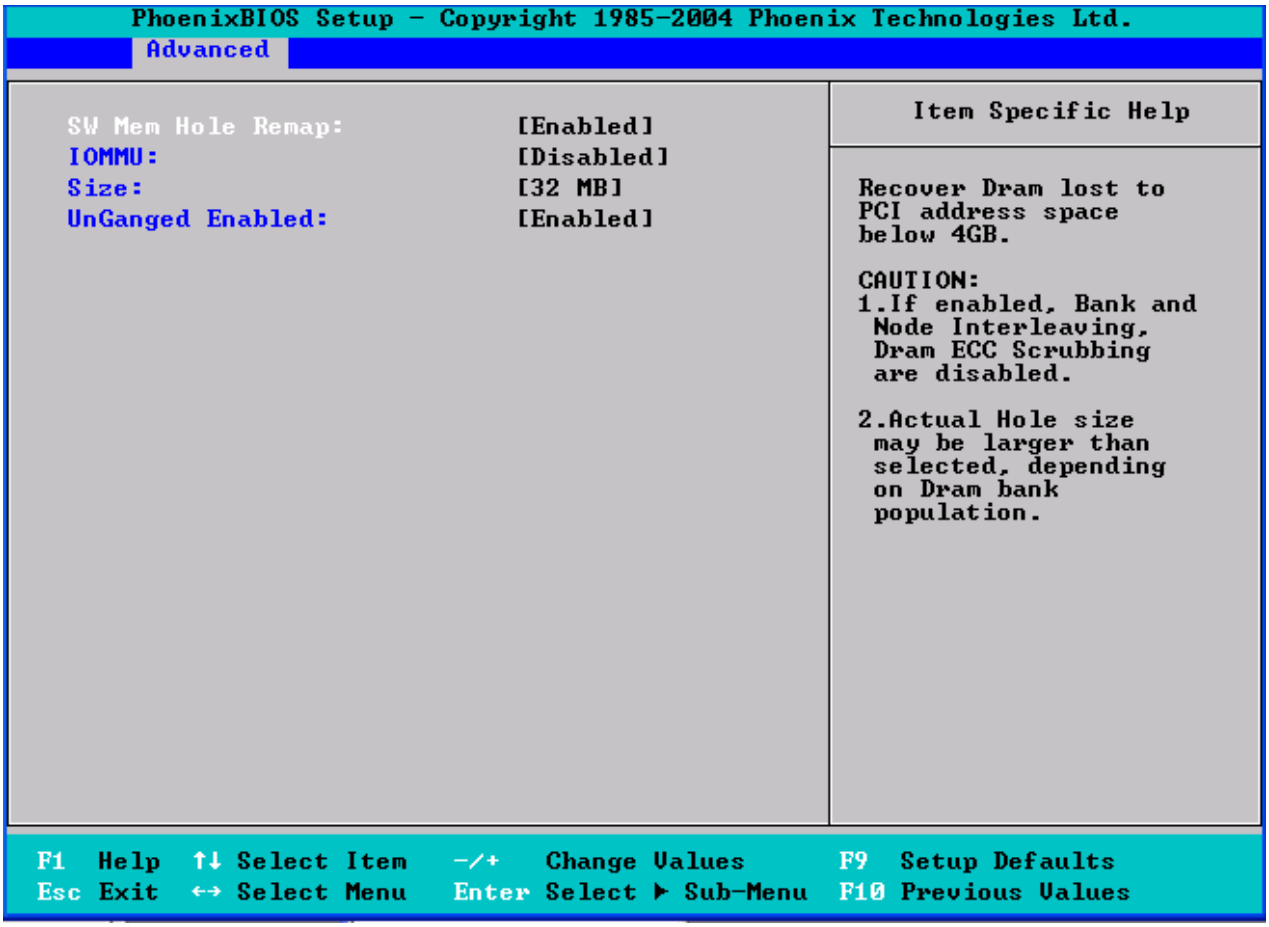
DRAM ECC Scrub Control
Sets the rate of background scrubbing for DRAM.
Options: **Disabled** / Enabled

DCache ECC Scrub Control
Sets the rate of background scrubbing for the DCache.
Options: **Disabled** / Enabled

L2 ECC Scrub Control
Sets the rate of background scrubbing for the L2 cache.
Options: **Disabled** / Enabled

ECC Multibit Error Detection
Enable multibit ECC error detection.
Options: **Disabled** / Enabled

3.4.1.2 Memory Controller Options Sub-Menu

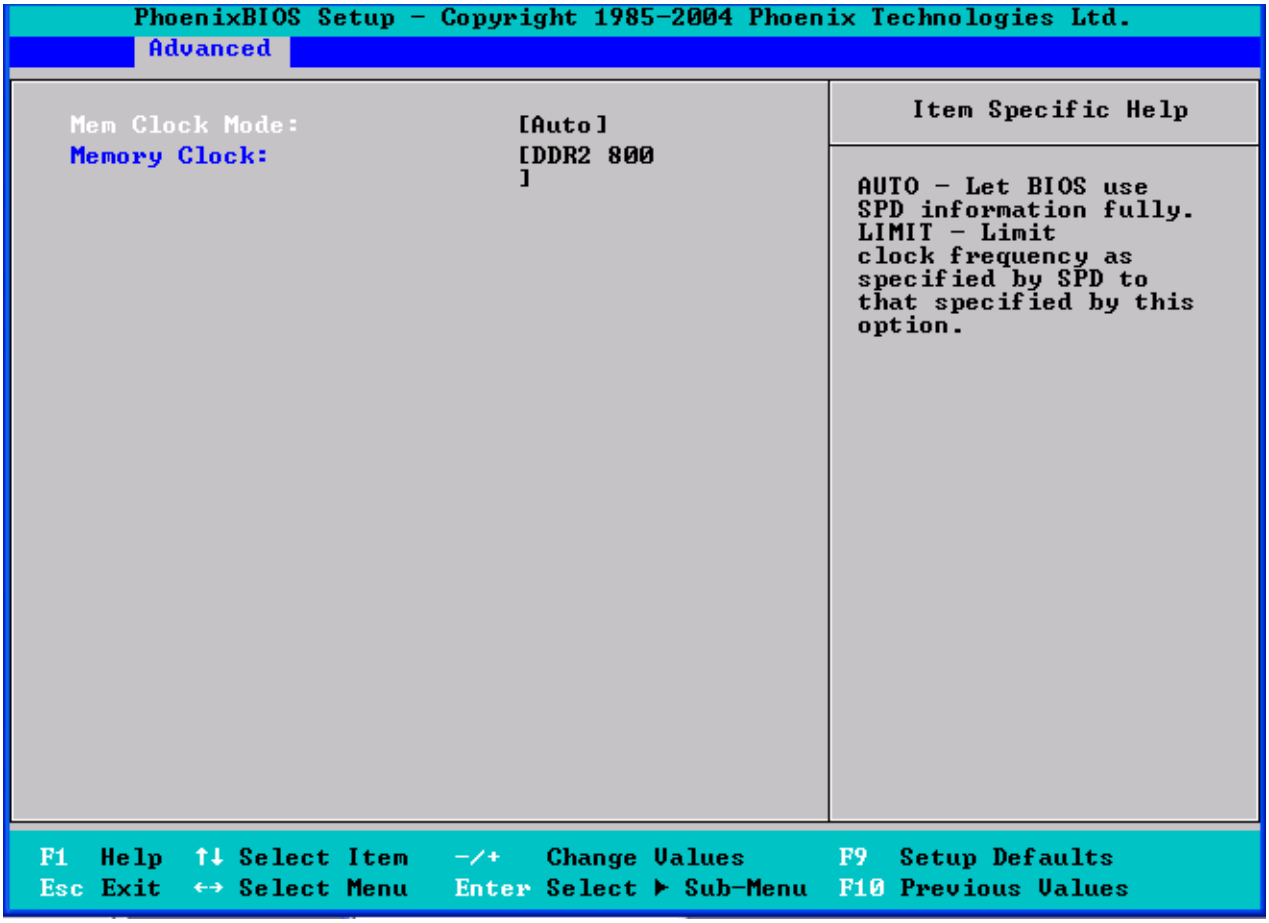

PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Advanced
SW Mem Hole Remap: [Enabled]
IOMMU: [Disabled]
Size: [32 MB]
UnGanged Enabled: [Enabled]
Item Specific Help
Recover Dram lost to PCI address space below 4GB.
CAUTION:
1.If enabled, Bank and Node Interleaving, Dram ECC Scrubbing are disabled.
2.Actual Hole size may be larger than selected, depending on Dram bank population.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

SW Mem Hole Remap
Recover DRAM lost to PCI address space below 4GB.
Options: **Enabled** / Disabled
CAUTION:
1. If enabled, Bank and Node Interleaving, Dram ECC Scrubbing are disabled.
2. Actual Hole size may be larger than selected, depending on Dram bank population.

IOMMU
IOMMU is supported on Linux based systems to convert 32bit PCI IO addresses to 64bits.
Options: **Disabled** / Enabled

Size
It allows you to select the IOMMU size.
Options: **32 MB** / 64 MB / 128 MB / 256 MB / 512 MB / 1 GB / 2 GB
UnGanged Enabled
[Enabled] DCT0 controls the channel A DDR2 bus while DCT1 controls the channel B DDR bus.
[Disabled] The two DRAM controllers can be linked to form a single logical controller.
Options: **Enabled** / Disabled

3.4.1.3 Memory Config

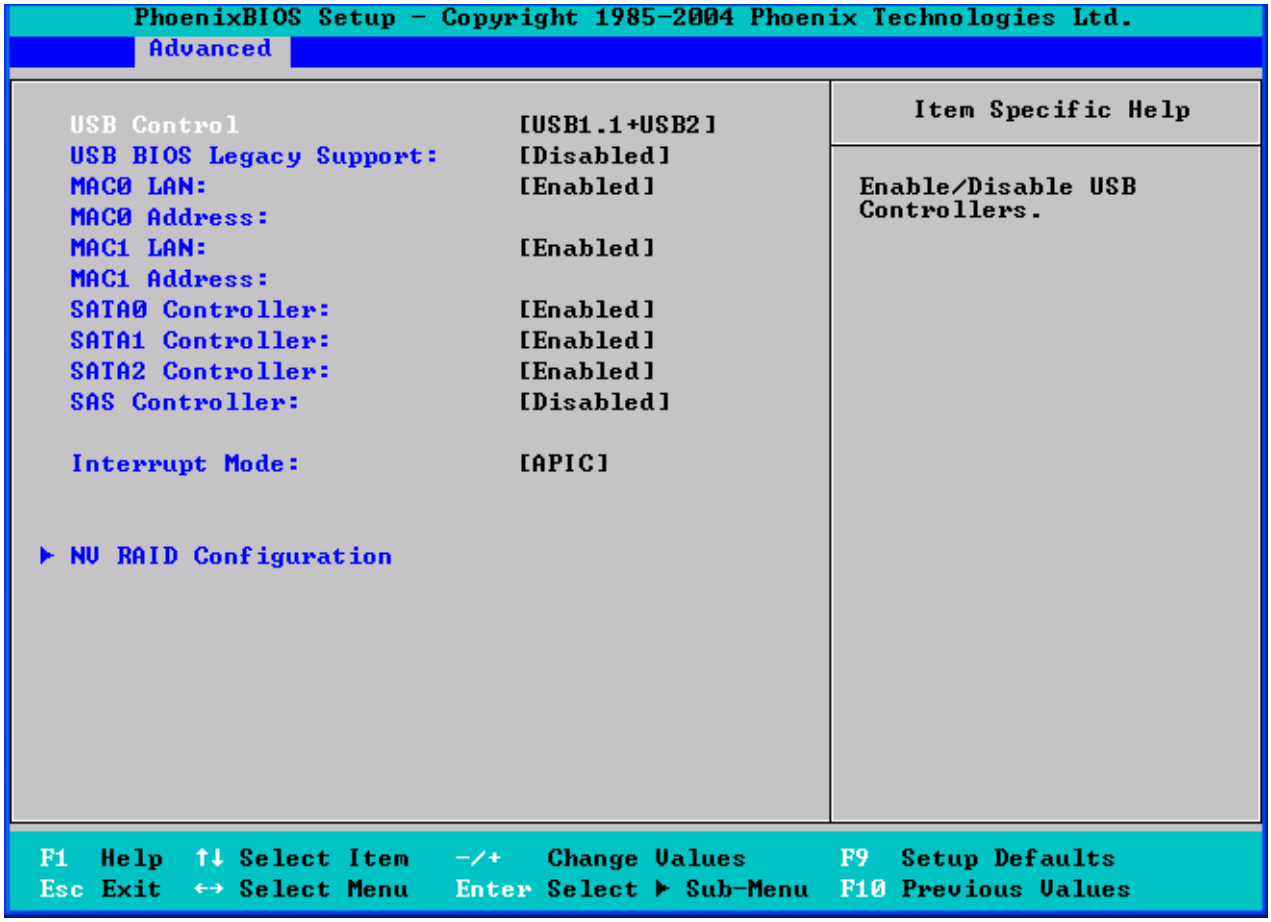

PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Advanced
Mem Clock Mode:
[Auto]
Memory Clock:
[DDR2 800
]
Item Specific Help
AUTO - Let BIOS use SPD information fully. LIMIT - Limit clock frequency as specified by SPD to that specified by this option.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Mem Clock Mode
[Auto] Let BIOS use SPD information fully.
[Limit] Limit clock frequency as specified by SPD to that specified by this option.
Options: **Auto** / Limit

Memory Clock
Adjust memory clock.
Options: DDR2 400 / DDR2 533 / DDR2 667 / DDR2 800

3.4.2 Integrated Devices

This section allows you to configure Integrated Devices.


PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Advanced
USB Control [USB1.1+USB2]
USB BIOS Legacy Support: [Disabled]
MAC0 LAN: [Enabled]
MAC0 Address:
MAC1 LAN: [Enabled]
MAC1 Address:
SATA0 Controller: [Enabled]
SATA1 Controller: [Enabled]
SATA2 Controller: [Enabled]
SAS Controller: [Disabled]
Interrupt Mode: [APIC]
NV RAID Configuration
Item Specific Help
Enable/Disable USB Controllers.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

USB Control
Enable/disable USB controllers.
Options: **USB1.1+USB2** / Disabled

USB BIOS Legacy Support
Enables or disables support for USB keyboards or mice. (Enable for use with a non-USB aware Operating System such as DOS or UNIX)
Options: **Disabled** / Enabled

MAC0 LAN
Enable/disable MAC1 LAN device.
Options: **Enabled** / Disabled

MAC0 LAN Bridge
Enable MAC1 LAN Bridge.
Options: **Enabled** / Disabled

MAC1 LAN
Enable/disable MAC2 LAN device.
Options: **Enabled** / Disabled

MAC1 LAN Bridge
Enable MAC2 LAN Bridge.

Options: **Enabled** / Disabled

SATA0 / SATA1 / SATA2 Controller
Enable/disable First Serial ATA Device.
NOTE: Mobile platform, enable SATA, SAVE and EXIT BIOS SETUP. Then must do a power cycle during next POST.
Options: **Enabled** / Disabled

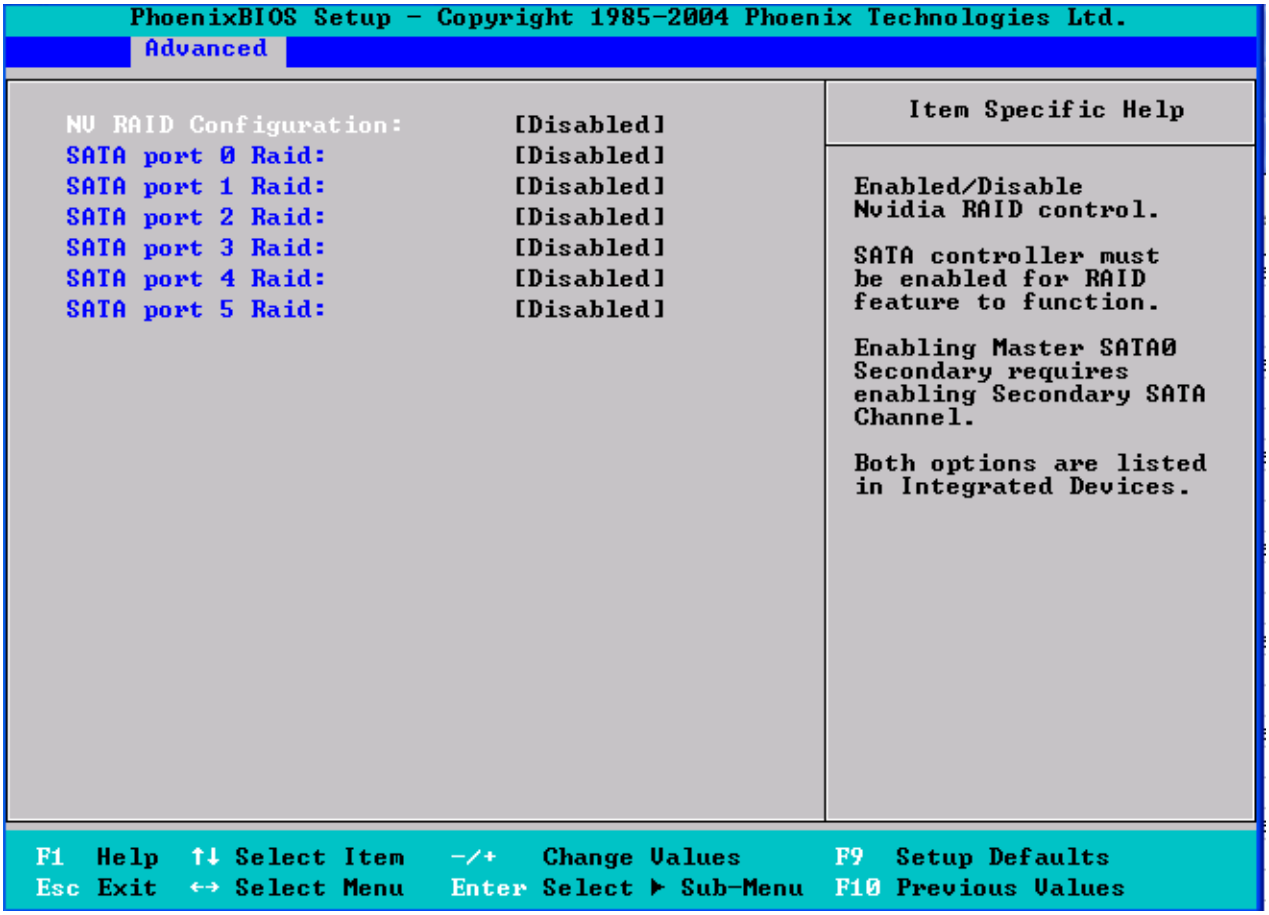
SAS Controller

Enable the integrated SAS controller.

Options: **Enabled** / Disabled

Interrupt Mode
Select interrupt mode between 8259/PIC mode or APIC mode.
Options: **APIC** / PIC

3.4.2.1 NV RAID Configuration Sub-Menu

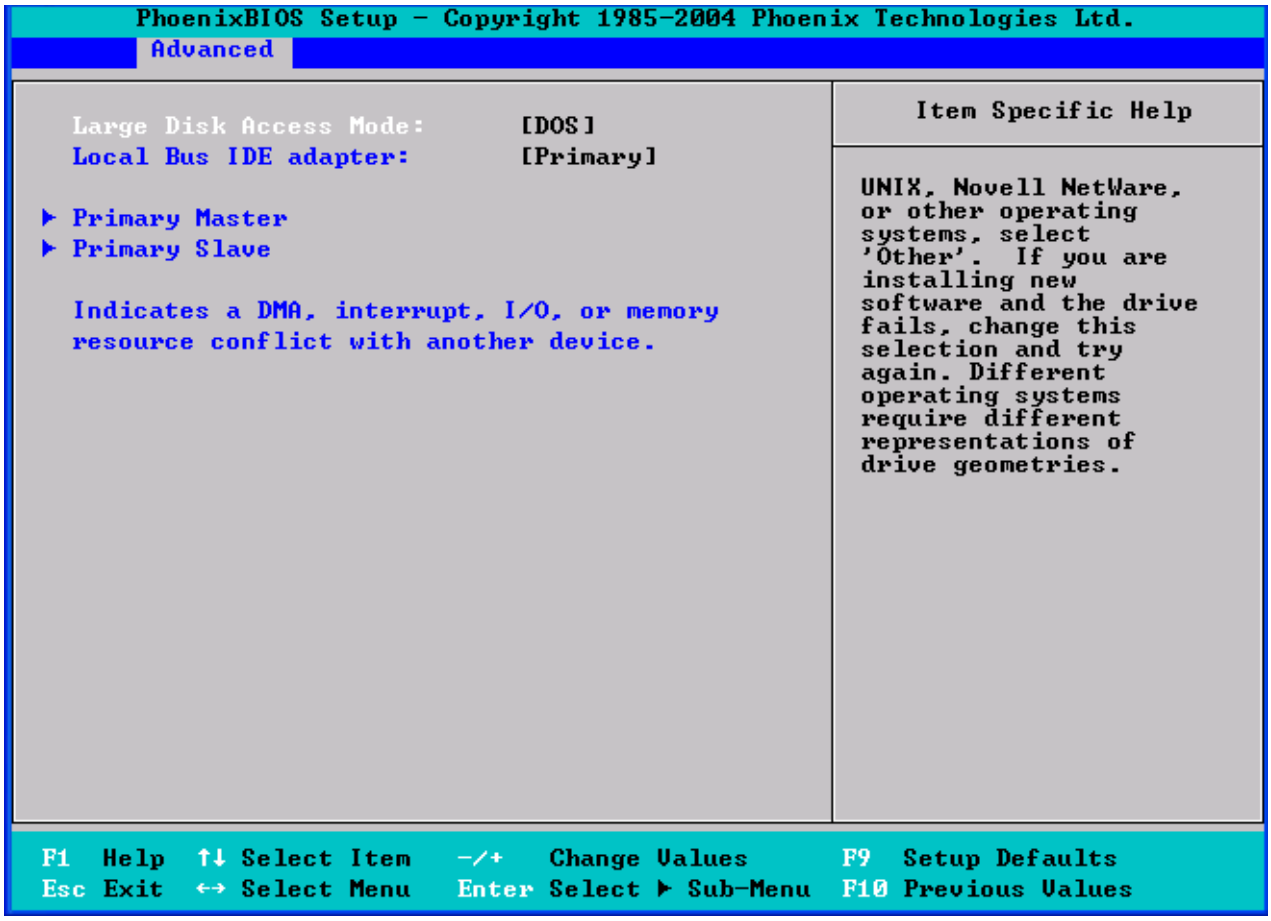

PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Advanced
NV RAID Configuration: [Disabled]
SATA port 0 Raid: [Disabled]
SATA port 1 Raid: [Disabled]
SATA port 2 Raid: [Disabled]
SATA port 3 Raid: [Disabled]
SATA port 4 Raid: [Disabled]
SATA port 5 Raid: [Disabled]
Item Specific Help
Enabled/Disable Nvidia RAID control.
SATA controller must be enabled for RAID feature to function.
Enabling Master SATA0 Secondary requires enabling Secondary SATA Channel.
Both options are listed in Integrated Devices.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

NV RAID Configuration
Enable/disable NVIDIA RAID control. SATA controller must be enabled for RAID feature to function. Enabling Master SATA0 Secondary requires enabling Secondary SATA Channel. Both options are listed in Integrated Devices.
Options: **Disabled** / Enabled

SATA port 0/1/2/3/4/5 Raid
Enable this device as RAID.
Options: **Disabled** / Enabled

3.4.3 IDE Configuration

This section allows you to fine tune the IDE configuration.


PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Advanced
Large Disk Access Mode: [DOS]
Local Bus IDE adapter: [Primary]
Primary Master
Primary Slave
Indicates a DMA, interrupt, I/O, or memory resource conflict with another device.
Item Specific Help
UNIX, Novell NetWare, or other operating systems, select 'Other'. If you are installing new software and the drive fails, change this selection and try again. Different operating systems require different representations of drive geometries.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Large Disk Access Mode

UNIX, Novell Netware or other operating systems, select [Other]. If you are installing new software and the drive fails, change this selection and try again. Different operating systems require different representations of drive geometries.

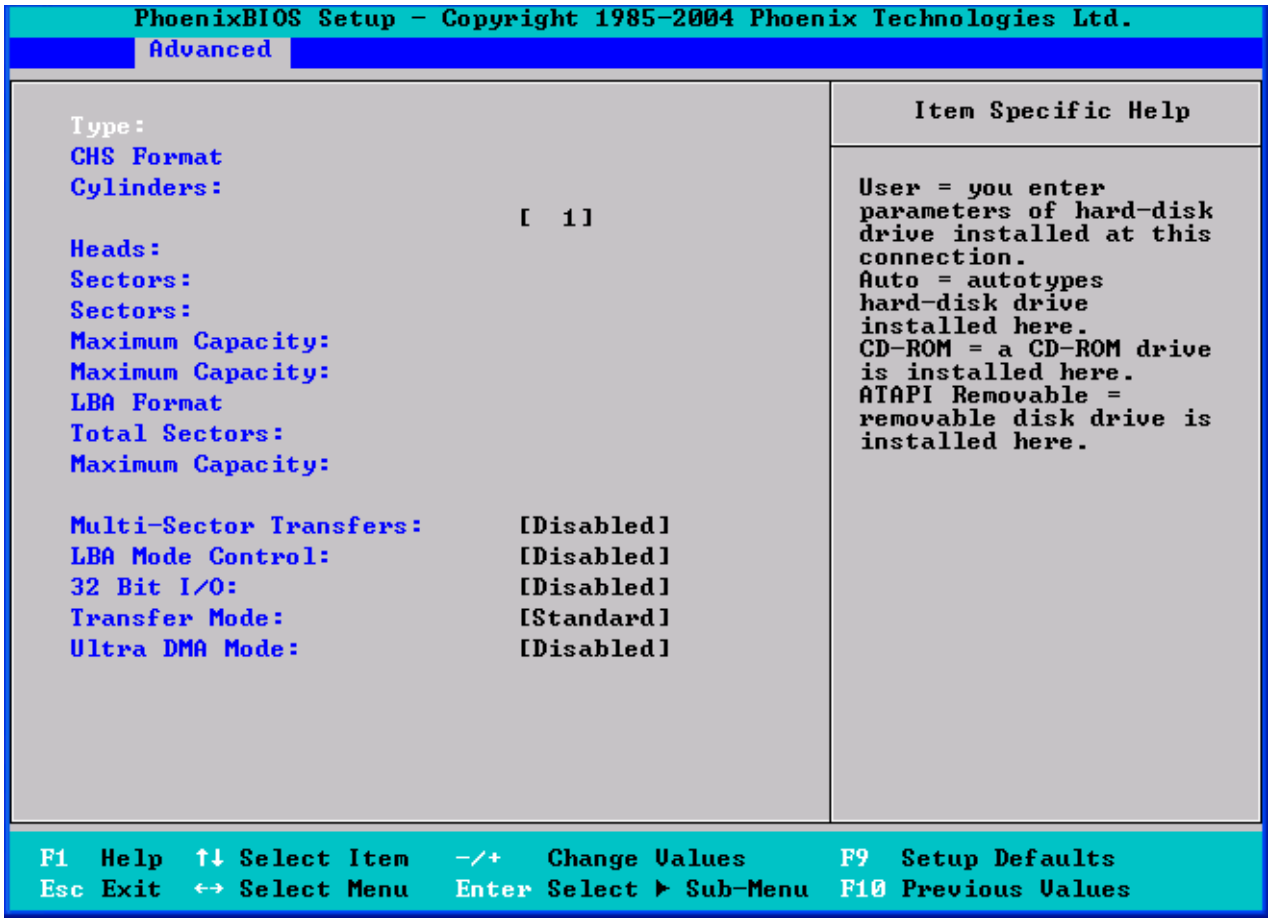
Options: Other / **DOS**

Local Bus IDE Adapter

Enable the integrated local bus IDE adapter.

Options: **Primary** / Secondary

3.4.3.1 Primary Master/Slave Sub-Menu


PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Advanced
Type:
CHS Format
Cylinders:
[1]
Heads:
Sectors:
Sectors:
Maximum Capacity:
Maximum Capacity:
LBA Format
Total Sectors:
Maximum Capacity:
Multi-Sector Transfers: [Disabled]
LBA Mode Control: [Disabled]
32 Bit I/O: [Disabled]
Transfer Mode: [Standard]
Ultra DMA Mode: [Disabled]
Item Specific Help
User = you enter parameters of hard-disk drive installed at this connection.
Auto = autotypes hard-disk drive installed here.
CD-ROM = a CD-ROM drive is installed here.
ATAPI Removable = removable disk drive is installed here.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

The system displays advanced details like the number of heads/cylinders/sectors on the detected disk and the maximum storage capacity of the disk.
This option lets you set the following hard disk parameters:

Type
Selects the type of device connected to the system.
Options: Auto / CD/DVD / Not Installed / ARMD

Multi-Sector Transfers
This option allows you to specify the number of sectors per block for multiple sector transfers.
Options: Disabled / 2 Sectors / 4 Sectors / 8 Sectors / 16 Sectors

LBA Mode Control
Enables or disables LBA Mode.
In LBA Mode, instead of referring to a cylinder, head and sector number, each sector is instead assigned a unique "sector number". In essence, the sectors are numbered 0, 1, 2, etc. up to (N-1), where N is the number of sectors on the disk.
In order for LBA to work, it must be supported by the BIOS and operating system, but since it is also a new way of talking to the hard disk, the disk must support it as well. All newer hard disks do in fact support LBA, and when auto detected by a BIOS supporting LBA, will be set up to use that mode.
When LBA is turned on, the BIOS will enable geometry translation. This translation may be done in the same way that it is done in Extended CHS or large mode, or it

may be done using a different algorithm called LBA-assist translation. The translated geometry is still what is presented to the operating system for use in Int 13h calls. The difference between LBA and ECHS is that when using ECHS the BIOS translates the parameters used by these calls from the translated geometry to the drive's logical geometry. With LBA, it translates from the translated geometry directly into a logical block (sector) number.
LBA has in recent years become the dominant form of hard disk addressing. Since the 8.4 GB limit of the Int13h interface was reached, it became impossible to express the geometry of large hard disks using cylinder, head and sector numbers, translated or not, while remaining below the Int13h limits of 1,024 cylinders, 256 heads and 63 sectors. Therefore, modern drives are no longer specified in terms of classical geometry, but rather in terms of their total number of user data sectors and addressed using LBA.
Options: Disabled / Enabled

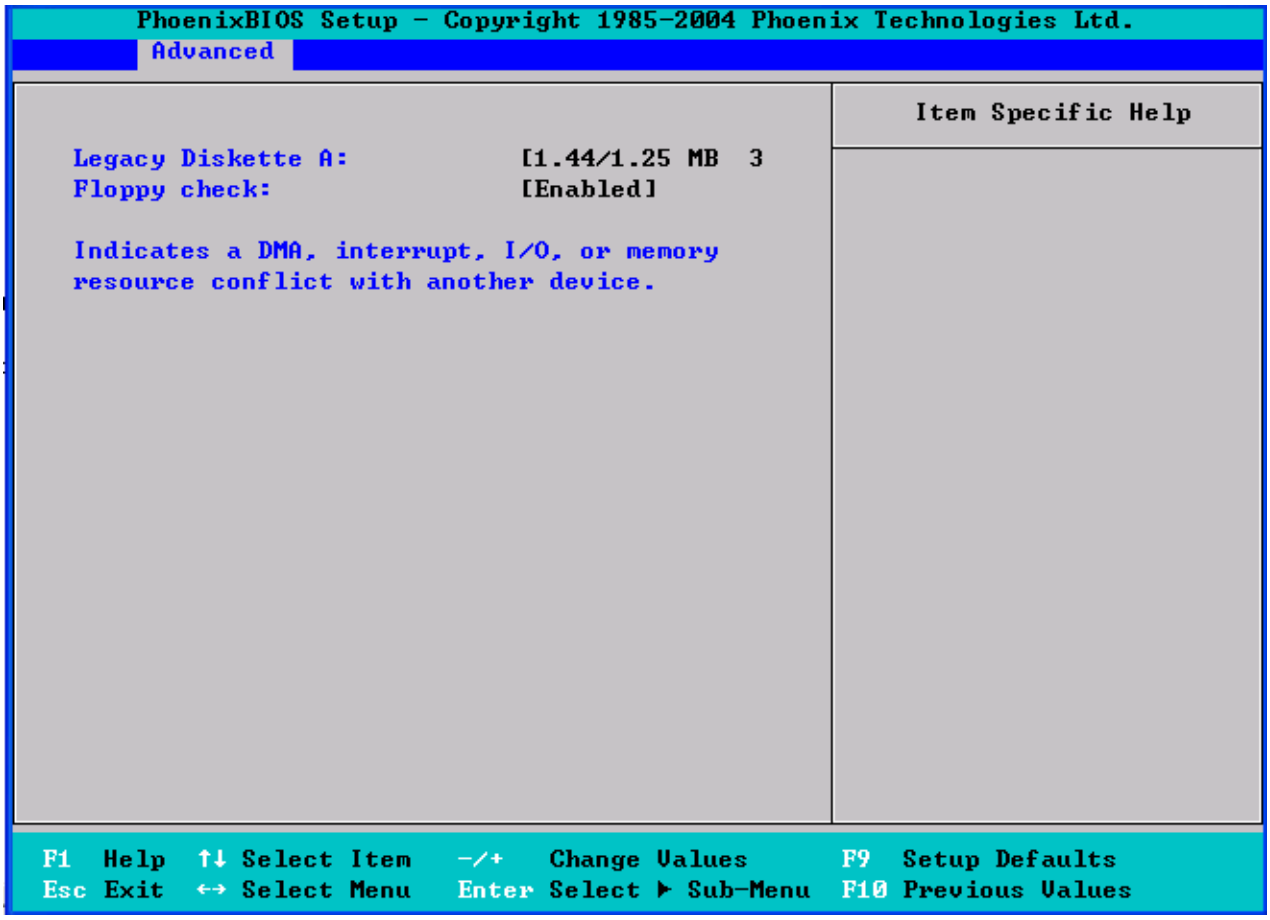
32 Bit I/O
Enables or disables 32 bit data transfer mode.
Enabling this option causes the PCI hard disk interface controller to bundle together two 16-bit chunks of data from the drive into a 32-bit group, which is then transmitted to the processor or memory. This results in a small performance increase.
Options: Enabled / Disabled

Transfer Mode
These modes determine the speed at which data is transferred to and from the drive. The Auto option automatically determines the correct transfer rates.
Options: Auto / Standard / Fast PIO 1 / Fast PIO 2 / Fast PIO 3 / Fast PIO 4 / FPIO 3 / DMA 1 / FPIO 4 / DMA 2

Ultra DMA Mode
Enables or disables Ultra DMA Mode.
Ultra DMA (UDMA, or, more accurately, Ultra DMA/33) is a protocol for transferring data between a hard disk drive through the computer's data paths (or bus) to the computer's random access memory (RAM). The Ultra DMA/33 protocol transfers data in burst mode at a rate of 33.3 MBps (megabytes per second), twice as fast as the previous Direct Memory Access (DMA) interface.
Ultra DMA support in your computer means that it will boot (start) and open new applications more quickly. It will also help users of graphics-intensive and other applications that require large amounts of access to data on the hard drive. Ultra DMA uses Cyclical Redundancy Checking (CRC), offering a new level of data protection.
Because the Ultra DMA protocol is designed to work with legacy application PIO and DMA protocols, it can be added to many existing computers by installing an Ultra DMA/33 Peripheral Component Interconnect adapter card. Ultra DMA uses the same 40-pin Integrated Drive Electronics interface cable as PIO and DMA.
Options: Disabled **/** Mode 0 / Mode 1 / Mode 2 / Mode 5

3.4.4 Floppy Configuration

This section allows you to select the Floppy Configuration.

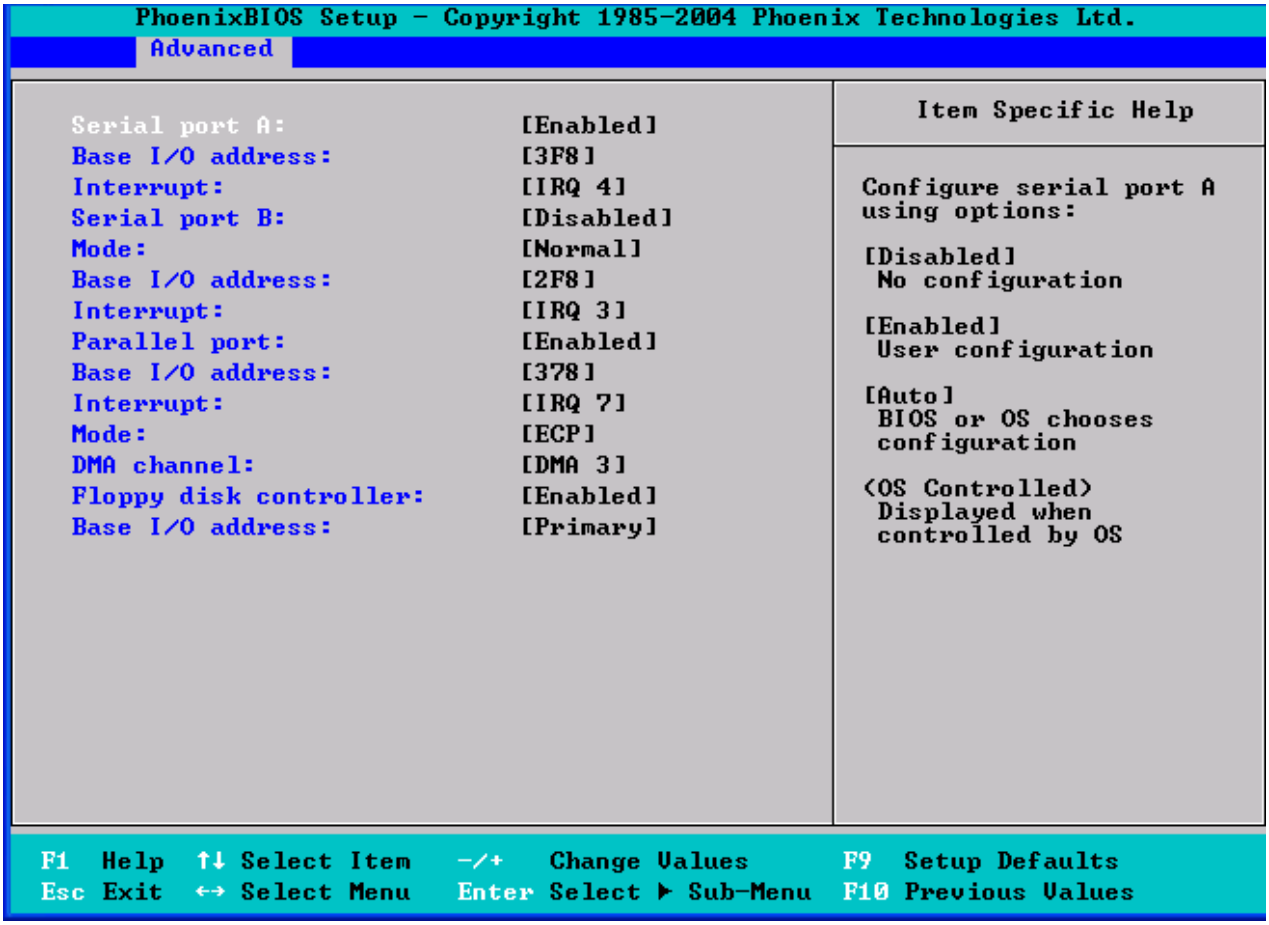

PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Advanced
Item Specific Help
Legacy Diskette A: [1.44/1.25 MB 3
Floppy check: [Enabled]
Indicates a DMA, interrupt, I/O, or memory resource conflict with another device.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Legacy Diskette A
Selects floppy type.
Options: NONE / 360 KB, 5.25 in / 1.2 MB, 5.25 in / 720 KB, 3.5 in / **1.44/1.25 MB, 3.5 in /** 2.88 MB, 3.5 in

Floppy check
Enabled verifies floppy type on boot;
Disabled speeds boot.
Options: **Enabled** / Disabled

3.4.5 I/O Device Configuration

This setting allows you to select the I/O Device Configuration.


PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Advanced
Serial port A: [Enabled]
Base I/O address: [3F8]
Interrupt: [IRQ 4]
Serial port B: [Disabled]
Mode: [Normal]
Base I/O address: [2F8]
Interrupt: [IRQ 3]
Parallel port: [Enabled]
Base I/O address: [378]
Interrupt: [IRQ 7]
Mode: [ECP]
DMA channel: [DMA 3]
Floppy disk controller: [Enabled]
Base I/O address: [Primary]
Item Specific Help
Configure serial port A using options:
[Disabled] No configuration
[Enabled] User configuration
[Auto] BIOS or OS chooses configuration
(OS Controlled) Displayed when controlled by OS
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Serial Port A
Configure Serial Port A using options:
[Disabled]: no configuration
[Enabled]: user configuration
[Auto]: BIOS or OS chooses configuration
[OS Controlled]: displayed when controlled by OS
Options: Enabled / Disabled / **Auto** / OS Controlled

Base I/O Address
Set the base I/O address for Serial Port A.
Options: 3E8 / 2E8 / 2F8 / **3F8**

Interrupt
Set the Interrupt for Serial Port A.
Options: IRQ3 / **IRQ4**

Serial Port B
Configure serial port B using options:
[Disabled]: No configuration
[Enabled]: User configuration
Options: Disabled / **Enabled**

Base I/O Address
Set the base I/O address for serial port B.
Options: 3F8 **/ 2F8** / 3E8 / 2E8

Interrupt
Set the interrupt for serial port B.
Options: IRQ4 / **IRQ3**

Parallel Port
Configure parallel port using options:
[Disabled]: No configuration
[Enabled]: User configuration
Options: Disabled / **Enabled**

Base I/O Address
Set the base I/O address for the parallel port.
Options: **378 /** 278 / 3BC / Disabled

Interrupt
Set the interrupt for the parallel port.
Options: **IRQ7** / IRQ5

Mode
Set the mode for the parallel port using options: [Output Only], [Bi-directional], [EPP], [ECP].
Options: **ECP** / EPP / Output Only / Bi-directional

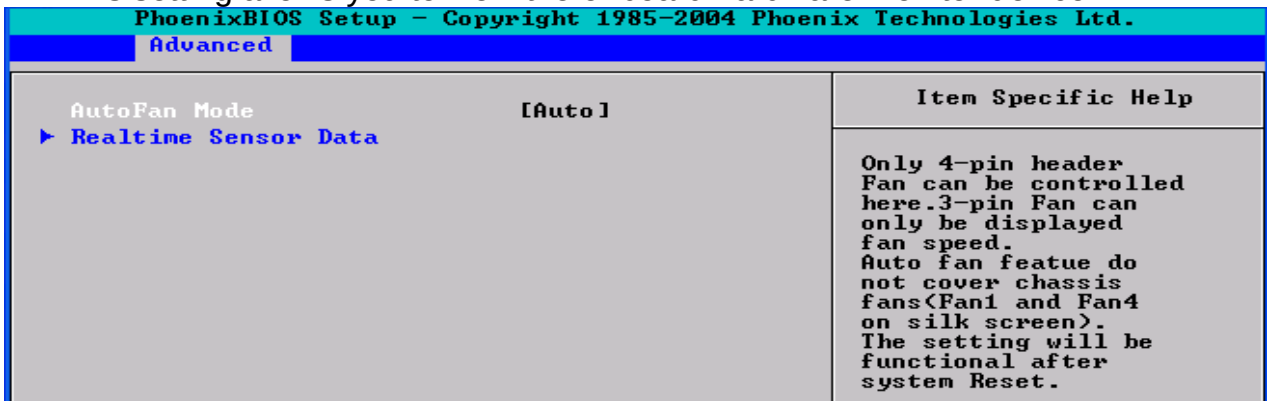
DMA Channel
Set the DMA channel for the parallel port.
Options: DMA1 / **DMA3**

Floppy Disk Controller
This defines how the floppy disk controller is detected and configured.
Options: Disabled / **Enabled** / Auto

Base I/O Address
Set the base I/O address for the floppy disk controller.
Options: Secondary / **Primary**

3.4.6 Hardware Monitoring

This setting allows you to view the onboard hardware monitor device.


PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Advanced
AutoFan Mode [Auto]
Realtime Sensor Data
Item Specific Help
Only 4-pin header Fan can be controlled here.3-pin Fan can only be displayed fan speed.
Auto fan featue do not cover chassis fans(Fan1 and Fan4 on silk screen).
The setting will be functional after system Reset.

AutoFan Mode

[Quiet Fans] are working with the lowest possible speed

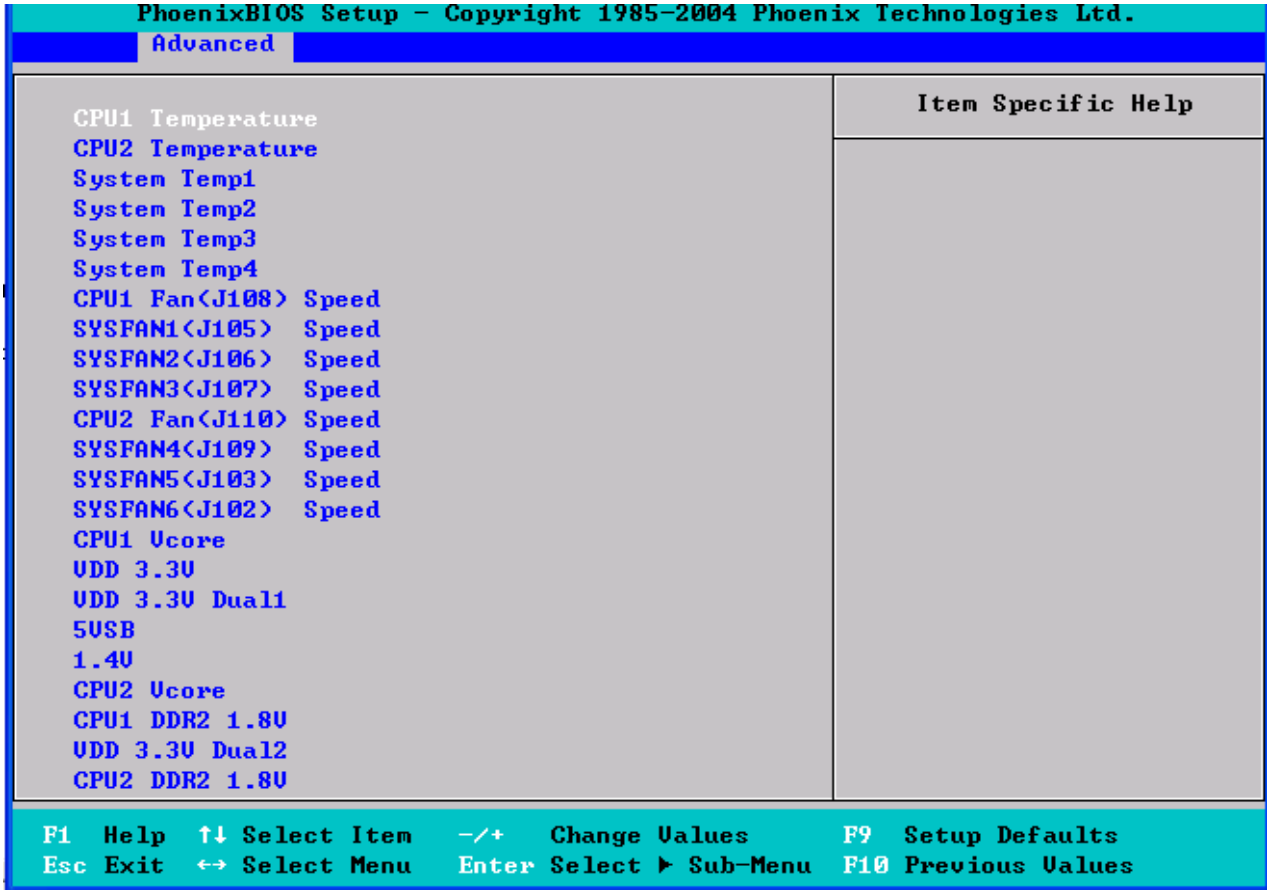
[Auto Mode] Optimum temperature Control at Maximum CPU performance

[Full Speed] All Fans are working

Options: Quiet / **Auto** / Full Speed

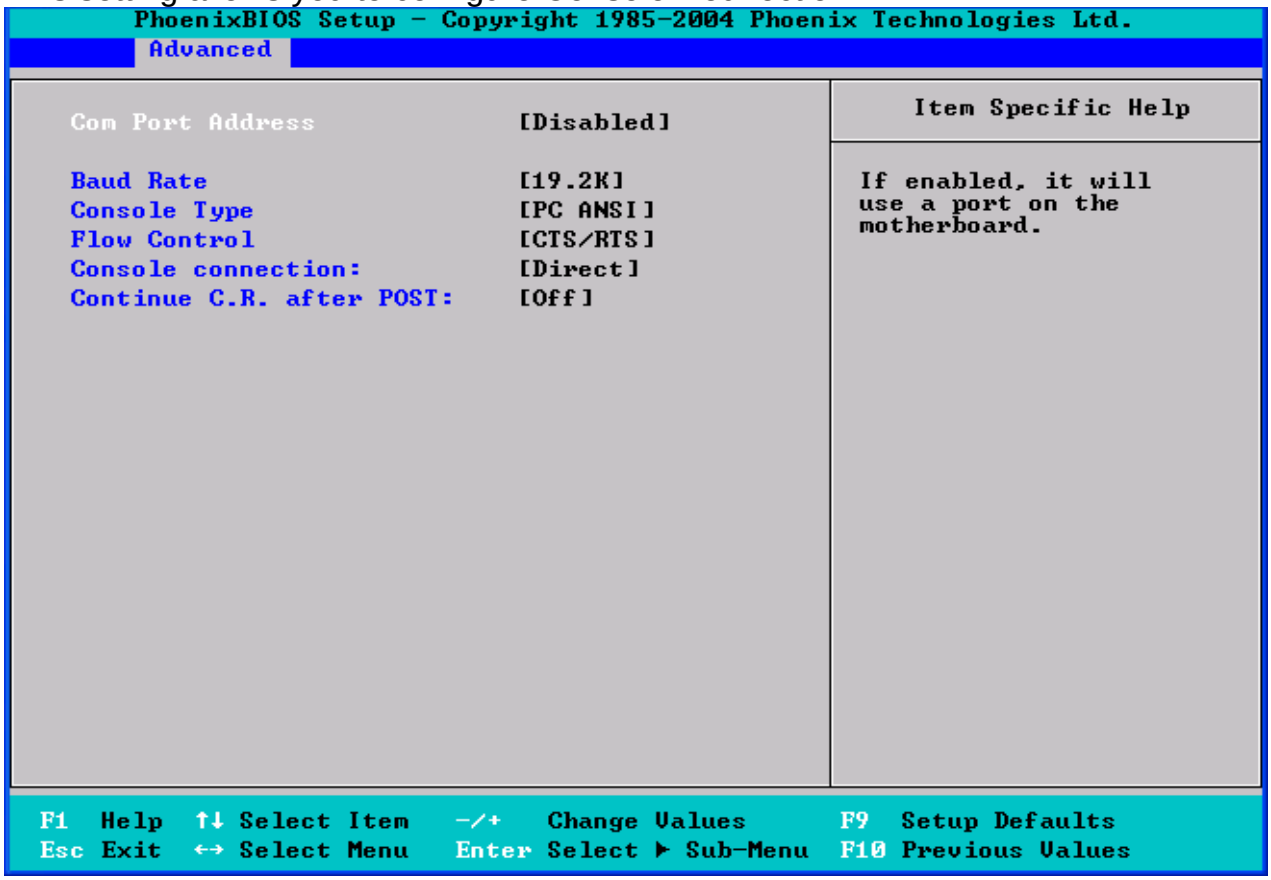
3.4.6.1 Realtime Sensor Data

This screen contains info from motherboard sensors, such as temperature and fan speed.



3.4.7 Console Redirection

This setting allows you to configure Console Redirection.


PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Advanced
Com Port Address [Disabled]
Baud Rate [19.2K]
Console Type [PC ANSI]
Flow Control [CTS/RTS]
Console connection: [Direct]
Continue C.R. after POST: [Off]
Item Specific Help
If enabled, it will use a port on the motherboard.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

COM Port Address
If enabled, it will use a port on the motherboard.
Options: Enabled / **Disabled**

Baud Rate
Enables the specified baud rate.
Options: 300 / 1200 / 2400 / 9600 / **19.2K / 38.4K / 57.6K / 115.2K**

Console Type
Enables the specified console type.
Options: VT100 / VT100, 8bit / **PC-ANSI** / VT100+ / VT-UTF8 / ASCII

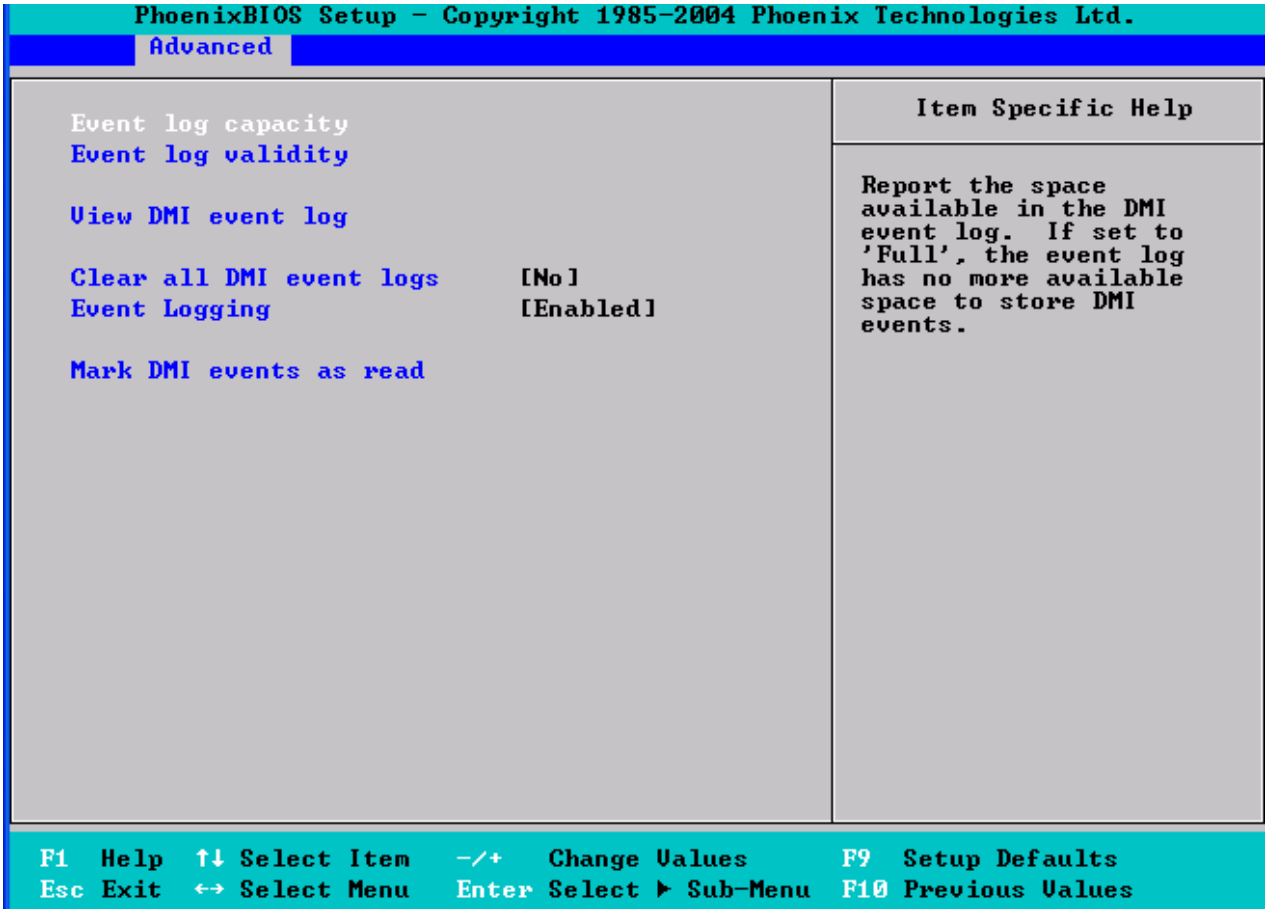
Flow Control
Enables flow control.
Options: Disabled / XON/XOFF / **CTS/RTS**

Console Connection
It indicates whether the console is connected directly to the system or a modem is used to connect.
Options: **Direct** / via Modem

Continue C.R. After POST
Enables Console Redirection after OS has loaded.
Options: **Off /** On

3.4.8 DMI Event Logging

This setting allows you to configure DMI Event Logging.


PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Advanced
Event log capacity
Event log validity
View DMI event log
Clear all DMI event logs [No]
Event Logging [Enabled]
Mark DMI events as read
Item Specific Help
Report the space available in the DMI event log. If set to 'Full', the event log has no more available space to store DMI events.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Event Log Capacity
It reports the space available in the DMI event log. If set to [Full], the event log has no more available space to store DMI events. (read only)

Event Log Validity
It reports the validity of the DMI event log. (read only)

View DMI Event Log
It allows you to view the contents of the DMI event log. (read only)

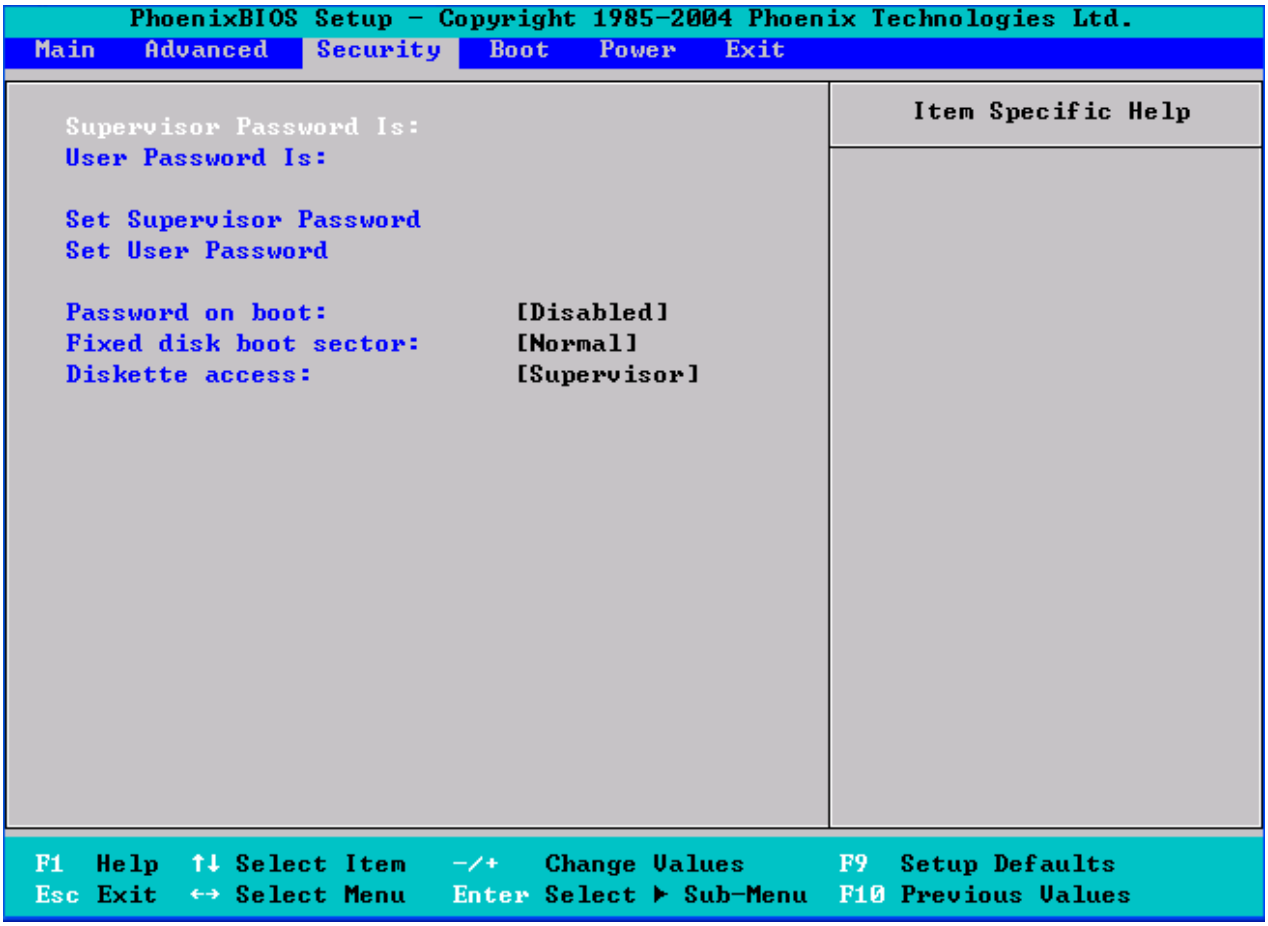
Clear All DMI Event Logs
Setting this to [Yes] will clear the DMI event log after rebooting.
Options: Yes / **No**

Event Logging
Select [Enabled] to allow logging of DMI events.
Options: **Enabled** / Disabled

Mark DMI Events as Read
Press [Enter] to mark all DMI events in the event log as read.

3.5 Security

These settings allow you to configure the security options for your system.


PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Main Advanced Security Boot Power Exit
Supervisor Password Is:
User Password Is:
Set Supervisor Password
Set User Password
Password on boot: [Disabled]
Fixed disk boot sector: [Normal]
Diskette access: [Supervisor]
Item Specific Help
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Supervisor Password Is / User Password Is

The system displays the current supervisor and user passwords.

Set Supervisor / User Password

This option allows the supervisor / user to set their password to restrict access to the BIOS settings.

Password on boot

When enabled, the system will ask for a password at every boot. The system will continue booting only if the correct password is entered. If the wrong password is entered three times, the system will automatically shut down.

Options: **Disabled** / Enabled

Fixed Disk Boot Sector

Write protects boot sector on hard disk to protect against viruses.

Options: **Normal** / Write Protect

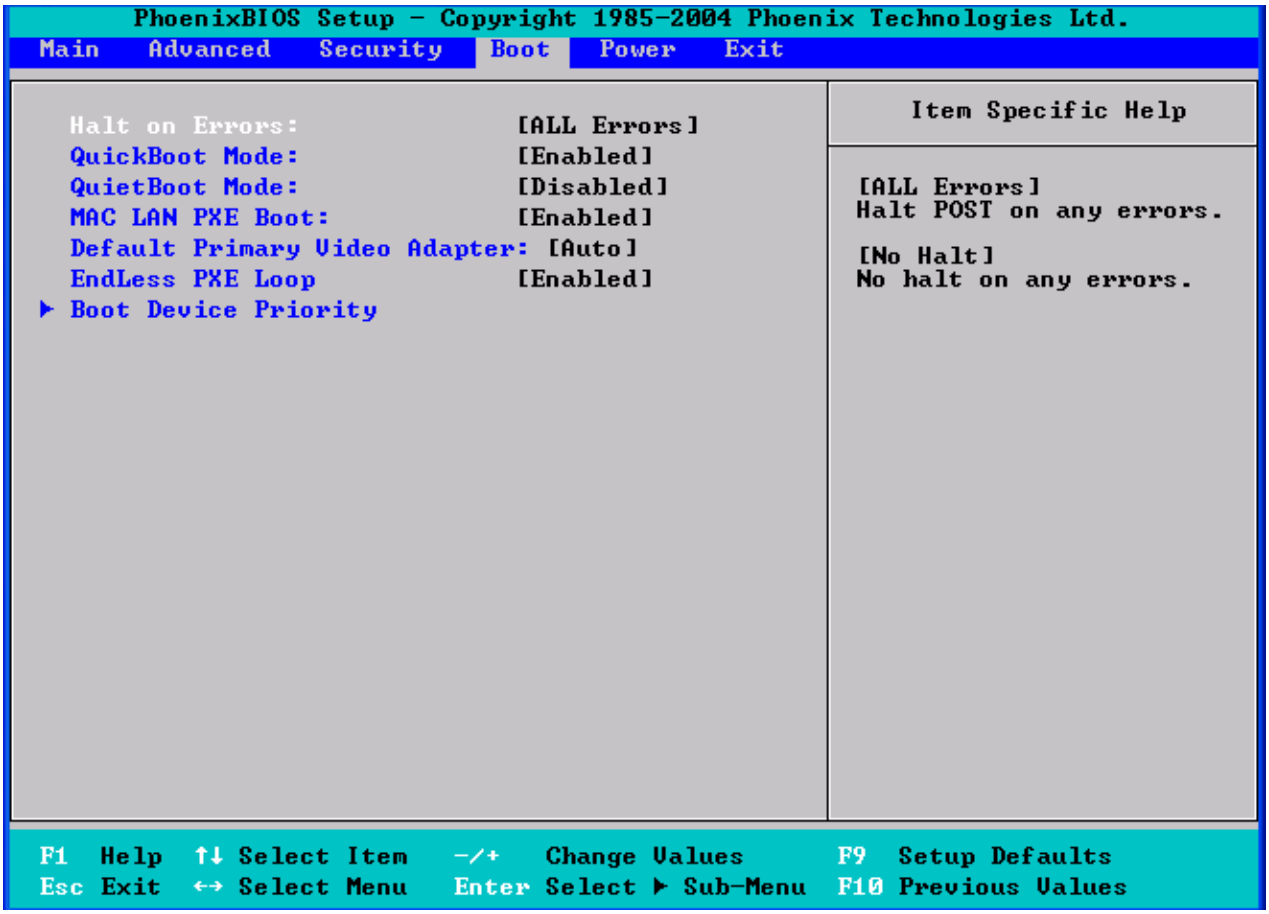
Diskette Access

It controls access to diskette drives.

Options: **Supervisor** / User

3.6 Boot

Use this screen to configure the boot priority order.


PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Main Advanced Security Boot Power Exit
Halt on Errors: [ALL Errors]
QuickBoot Mode: [Enabled]
QuietBoot Mode: [Disabled]
MAC LAN PXE Boot: [Enabled]
Default Primary Video Adapter: [Auto]
EndLess PXE Loop [Enabled]
Boot Device Priority
Item Specific Help
[ALL Errors]
Halt POST on any errors.
[No Halt]
No halt on any errors.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Halt on Errors

[All Errors] Halt POST on any errors.
[No Halt] No halt on any errors.
Options: **ALL Errors** / No Halt

QuickBoot Mode

This allows the system to skip certain tests while booting. This will decrease the time needed to boot the system.
Options: **Enabled** / Disabled

QuietBoot Mode

This displays the diagnostic screen during boot.
Options: Enabled / **Disabled**

MAC LAN PXE Boot

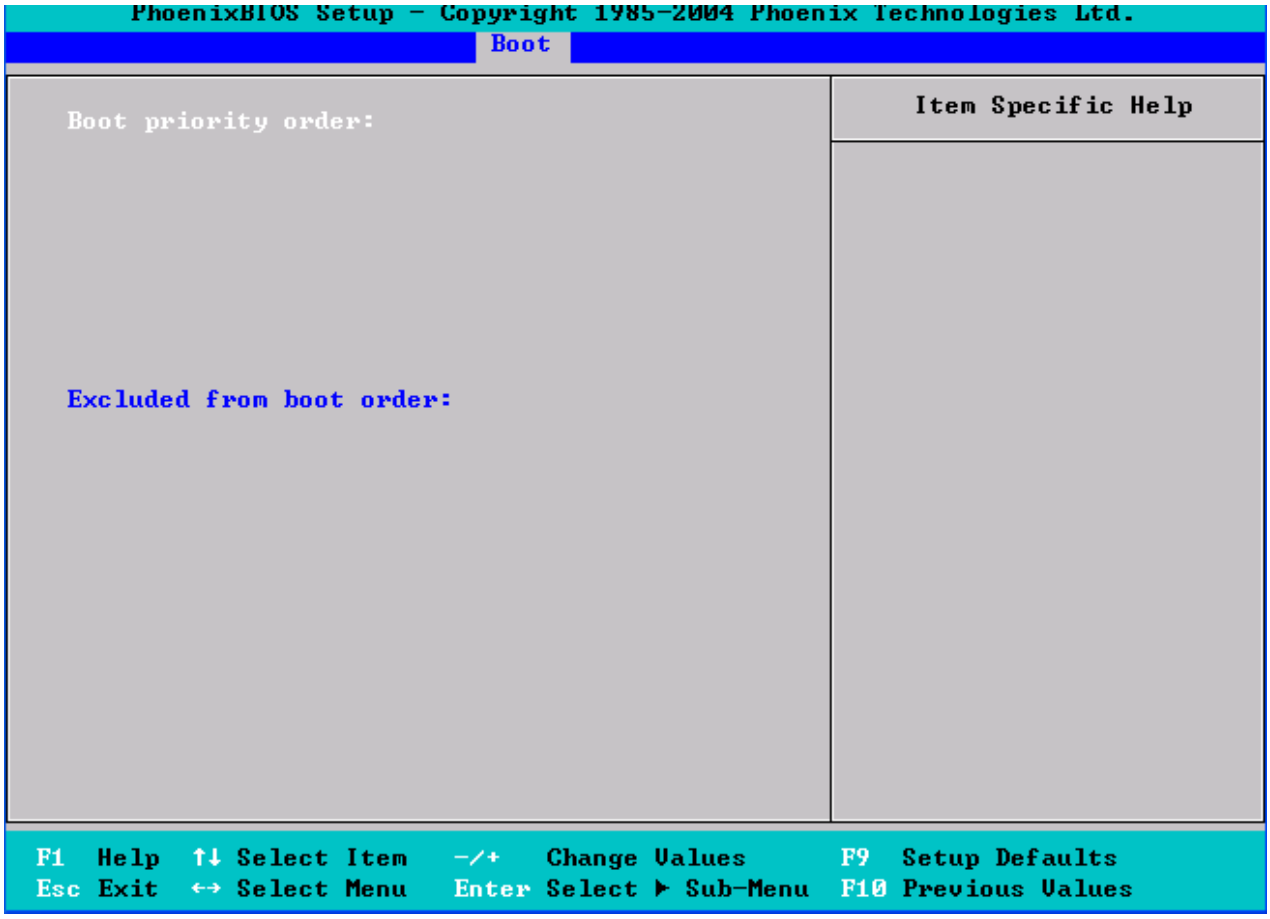
Enable/Disable boot from MAC LAN PXE OP-ROM<Preboot Execution Environment>
Options: **Enabled** / Disabled

Default Primary Video Adapter

To select the primary display device.
Options: **Auto** /

Endless PXE Loop
If enabled, system will only try to boot up from PXE, if PXE boot is failed, system will keep on trying until reaching PXE server.
Options: **Enabled** / Disabled

3.6.1 Boot Device Priority
To select which order the BIOS should use between devices when trying to boot.

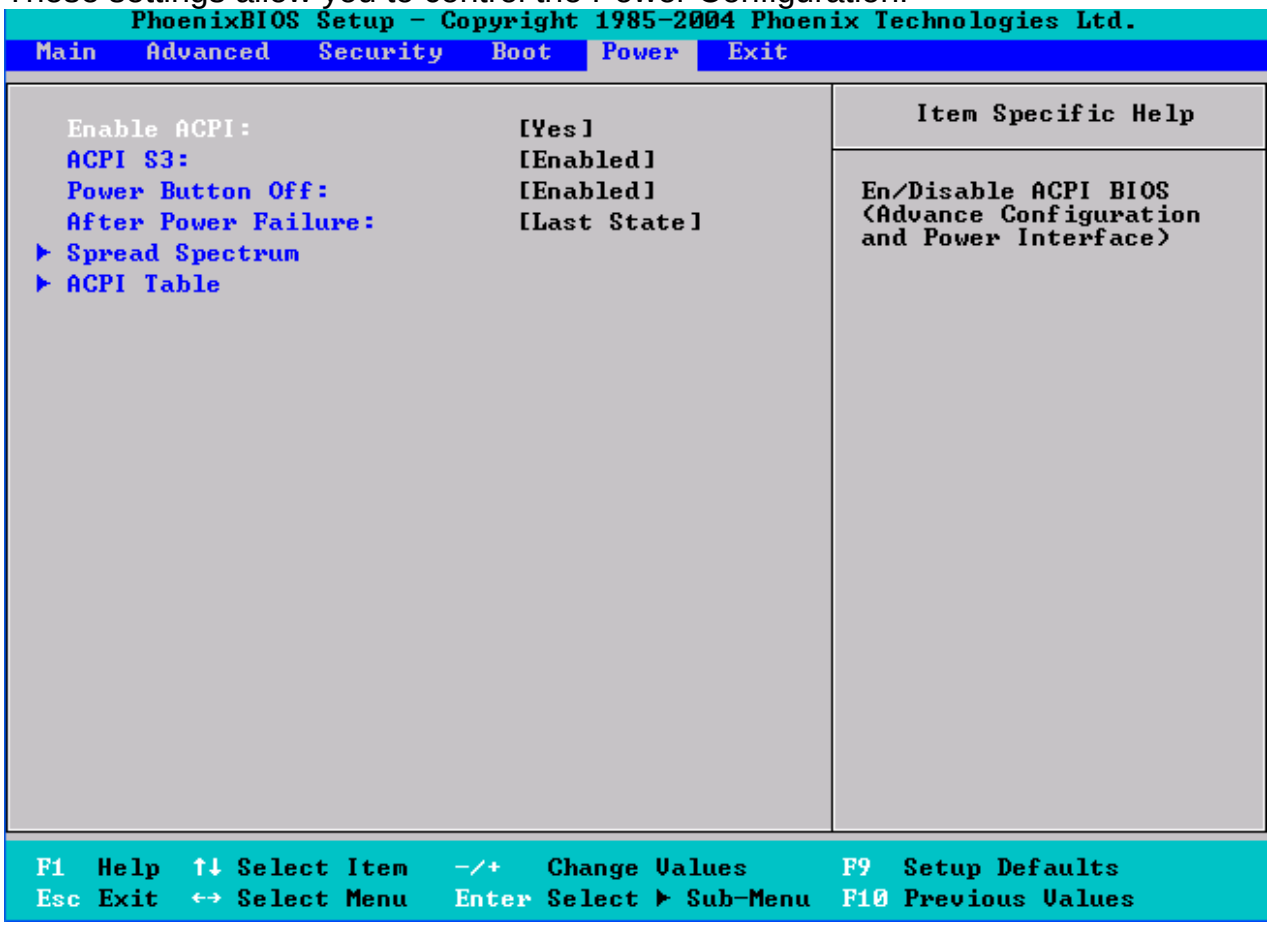

PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Boot
Boot priority order:
Excluded from boot order:
Item Specific Help
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Boot Priority Order
It shows the boot priority for installed devices.

Excluded from boot order
It lists devices to be excluded from boot order.

3.7 Power

These settings allow you to control the Power Configuration.


PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Main Advanced Security Boot Power Exit
Enable ACPI: [Yes]
ACPI S3: [Enabled]
Power Button Off: [Enabled]
After Power Failure: [Last State]
Spread Spectrum
ACPI Table
Item Specific Help
En/Disable ACPI BIOS (Advance Configuration and Power Interface)
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Enable ACPI

This allows you to enable or disable ACPI BIOS (Advance Configuration and Power Interface).

Options: No / **Yes**

ACPI S3

It allows you to disable the save-to-ram power mode.

Options: Enabled / **Disabled**

Power Button Off

[Enabled] will let power button possible to shutdown the system in legacy OS without holding for 4 seconds.

[Disabled] will force 4-second power button to shutdown the system.

Options: **Enabled** / Disabled

After Power Failure

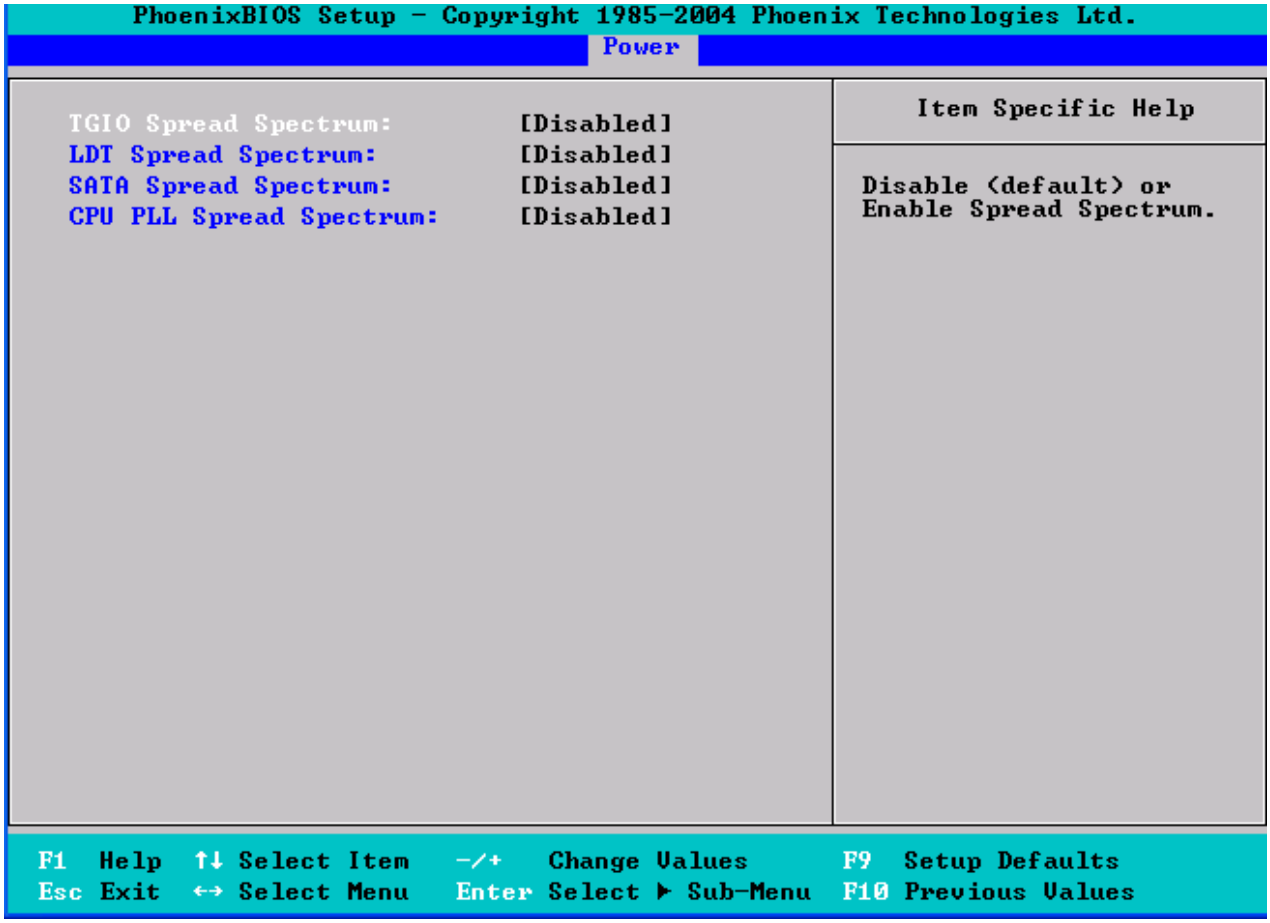
Sets the mode of operation if an AC/Power Loss occurs. The two modes are:

[Enabled]: restores the previous power state before loss occurred.

[Disabled]: keeps the power off until the power button is pressed.

Options: Power On / Stay Off / **Last State**

3.7.1 Spread Spectrum


PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Power
TGIO Spread Spectrum: [Disabled]
LDT Spread Spectrum: [Disabled]
SATA Spread Spectrum: [Disabled]
CPU PLL Spread Spectrum: [Disabled]
Item Specific Help
Disable (default) or Enable Spread Spectrum.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

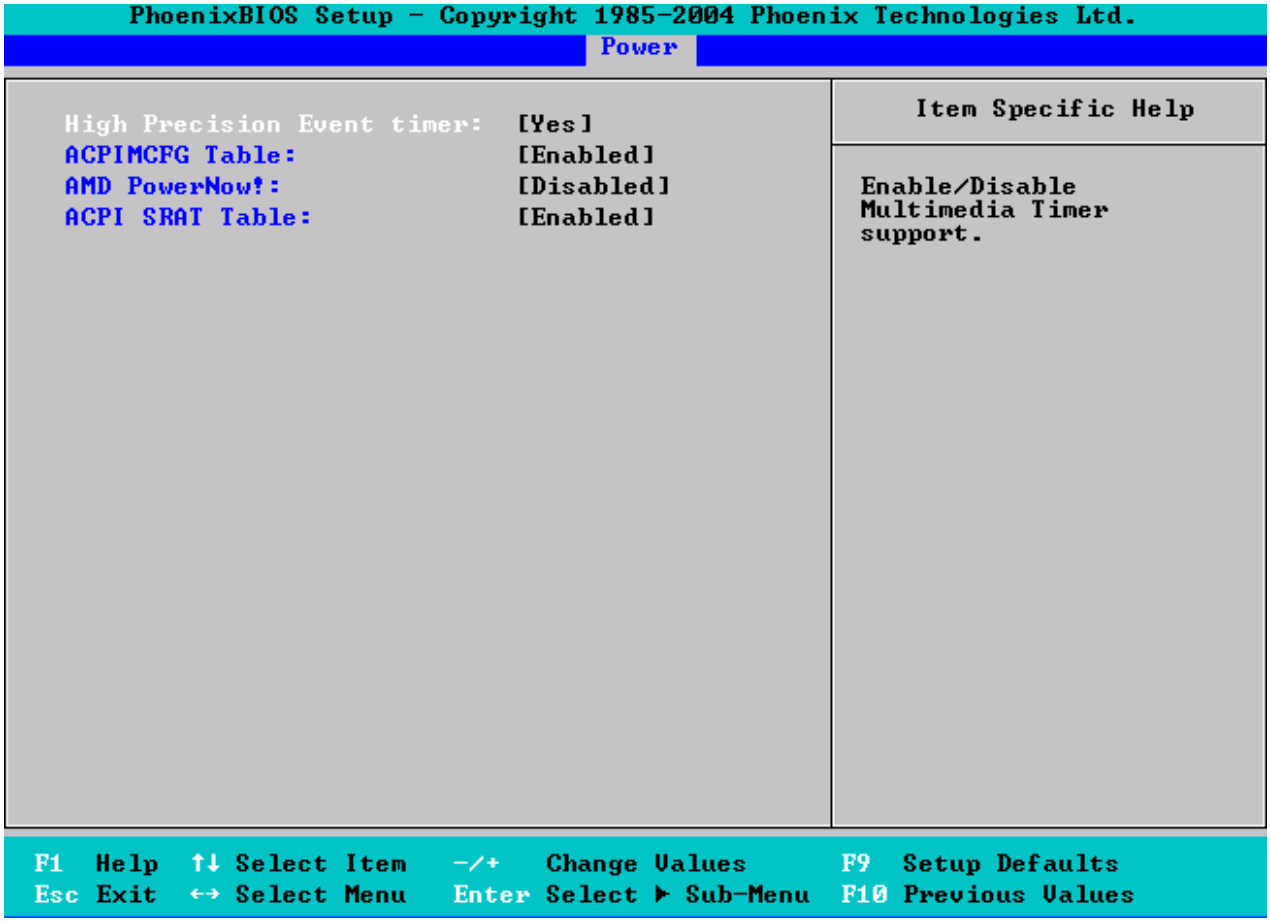
TGIO Spread Spectrum
Disable or Enable TGIO Spread Spectrum
Options: **Disabled** / Down Spread

LDT Spread Spectrum
Disable or Enable LDT Spread Spectrum
Options: **Disabled** / Center Spread

SATA Spread Spectrum
Disable or Enable LDT Spread Spectrum
Options: **Disabled** / Enabled

CPU PLL Spread Spectrum
Disable or Enable CPU Spread Spectrum
Options: **Disabled** / Enabled

3.7.2 ACPI Table


PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Power
High Precision Event timer: [Yes]
ACPIMCFG Table: [Enabled]
AMD PowerNow!: [Disabled]
ACPI SRAT Table: [Enabled]
Item Specific Help
Enable/Disable Multimedia Timer support.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

High Precision Event timer
Enable/Disable Multimedia Timer support.
Options: **Yes** / No

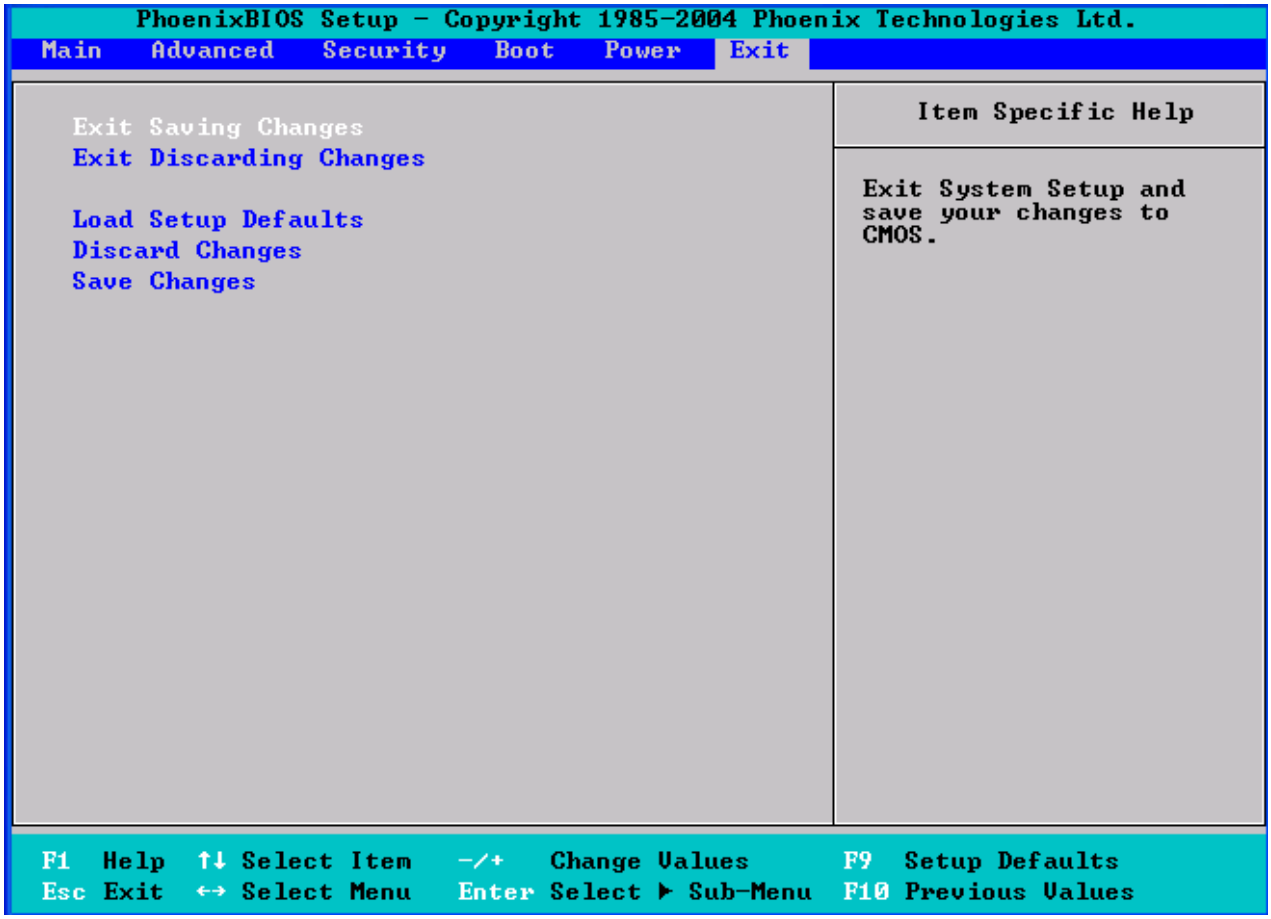
ACPIMCFG Table
Some version of Linux 'Kernel has problem of scan build-in memory controller or PCI BUS not covered by MCFG table, then we should disable ACPI MCFG tables.
Options: **Enabled** / Disabled

AMD PowerNow!
AMD PowerNow! Technology with Optimized Power Management (OPM).'
Options: **Enabled** / Disabled

APCI SRAT Table
Enable ACPI 2.0 static resources affinity table for ccNUMA systems.
Options: **Enabled** / Disabled

3.8 Exit

These settings set the exit options on your system.


PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Main Advanced Security Boot Power Exit
Exit Saving Changes
Exit Discarding Changes
Load Setup Defaults
Discard Changes
Save Changes
Item Specific Help
Exit System Setup and save your changes to CMOS.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Exit Saving Changes
This exits BIOS setup after saving the changes made.

Exit Discarding Changes
This exits BIOS setup after discarding the changes made.

Load Setup Defaults
This loads the factory default values.

Discard Changes
This discards all changes made without exiting BIOS setup.

Save Changes
This saves all changes made without exiting BIOS setup.

NOTE

Chapter 4: Diagnostics

Note: if you experience problems with setting up your system, always check the following things in the following order:

Memory, Video, CPU

By checking these items, you will most likely find out what the problem might have been when setting up your system. For more information on troubleshooting, check the TYAN website at: http://www.tyan.com.

4.1 Flash Utility

Every BIOS file is unique for the motherboard it was designed for. For Flash Utilities, BIOS downloads, and information on how to properly use the Flash Utility with your motherboard, please check the TYAN web site: http://www.tyan.com/

Note: Please be aware that by flashing your BIOS, you agree that in the event of a BIOS flash failure, you must contact your dealer for a replacement BIOS. There are no exceptions. TYAN does not have a policy for replacing BIOS chips directly with end users. In no event will TYAN be held responsible for damages done by the end user.

4.2 Phoenix BIOS Post Code

Code	Beeps / Description	Code	Beeps / Description
02h	Verify Real Mode	32h	Test CPU bus-clock frequency
03h	Disable Non-Maskable Interrupt (NMI)	33h	Initialize Phoenix Dispatch Manager
04h	Get CPU type	36h	Warm start shut down
06h	Initialize system hardware	38h	Shadow system BIOS ROM
08h	Initialize chipset with initial POST values	3Ah	Autosize cache
09h	Set IN POST flag	3Ch	Advanced configuration of chipset registers
0Ah	Initialize CPU registers	3Dh	Load alternate registers with CMOS values
0Bh	Enable CPU cache	42h	Initialize interrupt vectors
0Ch	Initialize caches to initial POST values	45h	POST device initialization
0Eh	Initialize I/O component	46h	2-1-2-3. Check ROM copyright notice
0Fh	Initialize the local bus IDE	48h	Check video configuration against CMOS
10h	Initialize Power Management	49h	Initialize PCI bus and devices
11h	Load alternate registers with initial POST values	4Ah	Initialize all video adapters in system
12h	Restore CPU control word during warm boot	4Bh	QuietBoot start (optional)
13h	Initialize PCI Bus Mastering devices	4Ch	Shadow video BIOS ROM
14h	Initialize keyboard controller	4Eh	Display BIOS copyright notice
16h	1-2-2-3. BIOS ROM checksum	50h	Display CPU type and speed
17h	Initialize cache before memory autosize	51h	Initialize EISA board
18h	8254 timer initialization	52h	Test keyboard
1Ah	8237 DMA controller initialization	54h	Set key click if enabled
1Ch	Reset Programmable Interrupt Controller	58h	2-2-3-1. Test for unexpected interrupts
20h	1-3-1-1. Test DRAM refresh	59h	Initialize POST display service
22h	1-3-1-3. Test 8742 KBD Controller	5Ah	Display prompt "Press F2 to enter SETUP"
24h	Set ES segment register to 4 GB	5Bh	Disable CPU cache
26h	Enable A20 line	5Ch	Test RAM between 512 and 640 KB
28h	Autosize DRAM	60h	Test extended memory
29h	Initialize POST Memory Manager	62h	Test extended memory address lines
2Ah	Clear 512 KB base RAM	64h	Jump to UserPatch1
2Ch	1-3-4-1. RAM failure on address	66h	Configure advanced cache registers
2Eh	1-3-4-3. RAM failure on	67h	Initialize Multi Processor

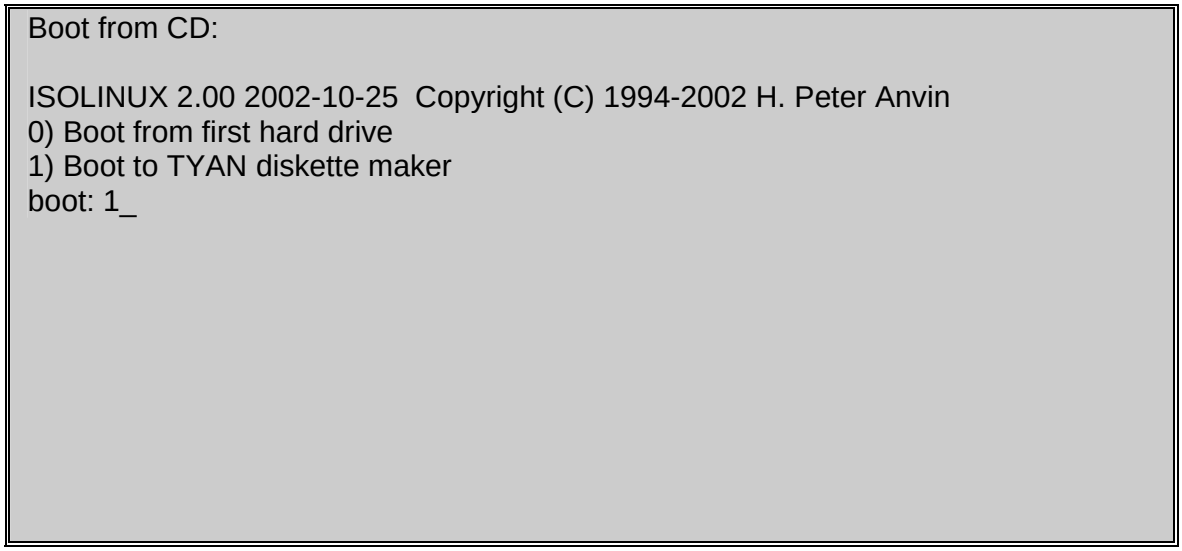
	data bits of low byte of memory bus		APIC
2Fh	Enable cache before system BIOS shadow	68h	Enable external and CPU caches
30h	1-4-1-1. RAM failure on data bits of high byte of memory bus	69h	Setup System Management Mode (SMM) area
Code	**Beeps / Description**	**Code**	**Beeps / Description**
6Ah	Display external L2 cache size	A2h	Check key lock
6Bh	Load custom defaults (optional)	A4h	Initialize Typematic rate
6Ch	Display shadow-area message	A8h	Erase F2 prompt
6Eh	Display possible high address for UMB recovery	AAh	Scan for F2 key stroke
70h	Display error messages	ACh	Enter SETUP
72h	Check for configuration errors	AEh	Clear Boot flag
76h	Check for keyboard errors	B0h	Check for errors
7Ch	Set up hardware interrupt vectors	B2h	POST done - prepare to boot operating system
7Eh	Initialize coprocessor if present	B4h	One short beep before boot
80h	Disable onboard Super I/O ports and IRQs	B5h	Terminate QuietBoot (optional)
81h	Late POST device initialization	B6h	Check password (optional)
82h	Detect and install external RS232 ports	B9h	Prepare Boot
83h	Configure non-MCD IDE controllers	BAh	Initialize DMI parameters
84h	Detect and install external parallel ports	BBh	Initialize PnP Option ROMs
85h	Initialize PC-compatible PnP ISA devices	BCh	Clear parity checkers
86h.	Re-initialize onboard I/O ports.	BDh	Display MultiBoot menu
87h	Configure Motherboard Devices	BEh	Clear screen (optional)
88h	Initialize BIOS Data Area	BFh	Check virus and backup reminders
89h	Enable Non-Maskable Interrupts (NMIs)	C0h	Try to boot with INT 19
8Ah	Initialize Extended BIOS Data Area	C1h	Initialize POST Error Manager (PEM)
8Bh	Test and initialize PS/2 mouse	C2h	Initialize error logging
8Ch	Initialize floppy controller	C3h	Initialize error display function
8Fh	Determine number of ATA drives (optional)	C4h	Initialize system error handler
90h	Initialize hard-disk controllers	C5h	PnPnd dual CMOS (optional)
91h	Initialize local-bus hard-disk controllers	C6h	Initialize notebook docking (optional)
92h	Jump to UserPatch2	C7h	Initialize notebook docking

			late
93h	Build MPTABLE for multi-processor boards	C8h	Force check (optional)
95h	Install CD ROM for boot	C9h	Extended checksum (optional)
96h	Clear huge ES segment register	D2h	BIOS Boot Block
97h	Fixup Multi Processor table	E0h	BIOS Boot Block
98h	1-2. Search for option ROMs.	E1h	BIOS Boot Block
99h	Check for SMART Drive (optional)	E2h	Initialize the CPU
9Ah	Shadow option ROMs	E3h	Initialize system timer
9Ch	Set up Power Management	E4h	Initialize system I/O
9Dh	Initialize security engine (optional)	E5h	Check force recovery boot
9Eh	Enable hardware interrupts	E6h	Checksum BIOS ROM
9Fh	Determine number of ATA and SCSI drives	E7h	Go to BIOS
A0h	Set time of day	E8h	Set Huge Segment
Code	**Beeps / Description**	**Code**	**Beeps / Description**
E9h	Initialize Multi Processor	F1h	Initialize Run Time Clock
EAh	Initialize OEM special code	F2h	Initialize video
EBh	Initialize PIC and DMA	F3h	Initialize System Management Mode
ECh	Initialize Memory type	F4h	Output one beep before boot
EDh	Initialize Memory size	F5h	Boot to Mini DOS
EEh	Shadow Boot Block	F6h	Clear Huge Segment
EFh	System memory test	F7h	Boot to Full DOS
F0h	Initialize interrupt vectors		

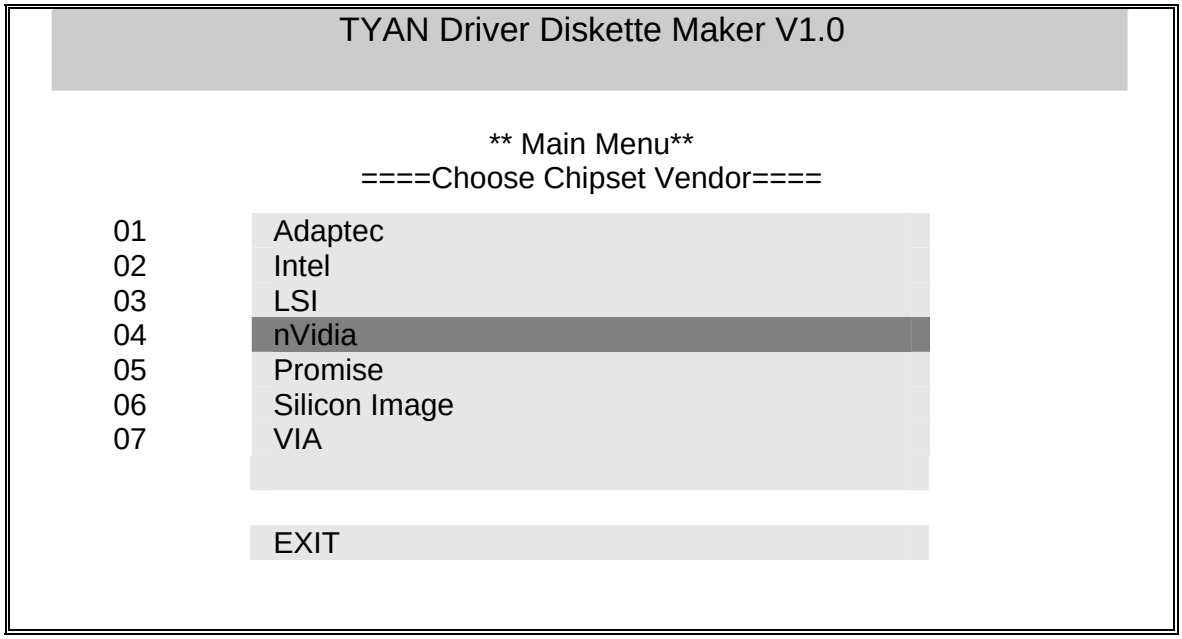
Appendix I: How to Make a Driver Diskette

Follow the steps below to make a driver diskette from the TYAN driver CD provided.

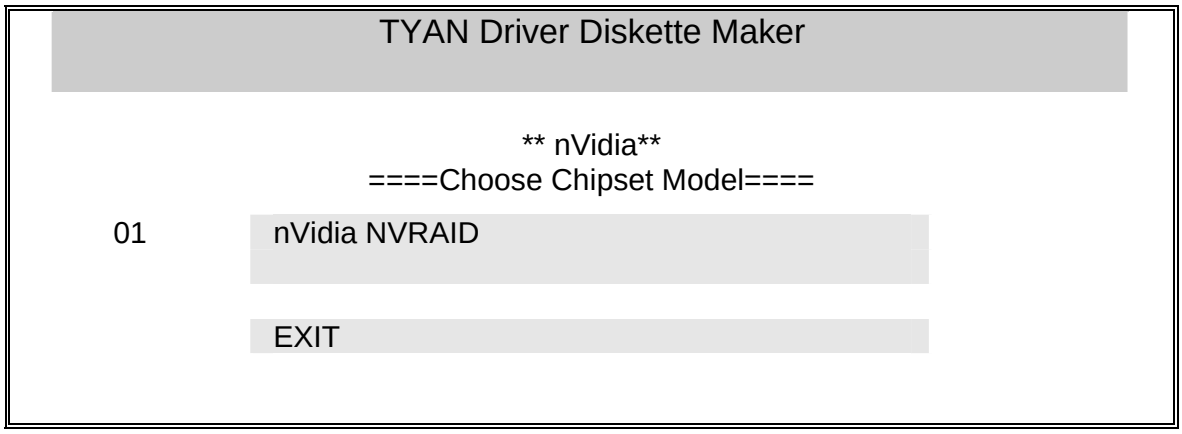
1. Start the system and insert the TYAN CD into the CD-ROM drive to boot from CD. You will see the following menu. Then press [1] and [Enter] to boot the system to TYAN diskette maker. (If you would like to boot from hard disk, press 0 and Enter or just wait for 10 seconds to boot automatically from hard disk.).


Boot from CD:
ISOLINUX 2.00 2002-10-25 Copyright (C) 1994-2002 H. Peter Anvin
0) Boot from first hard drive
1) Boot to TYAN diskette maker
boot: 1_

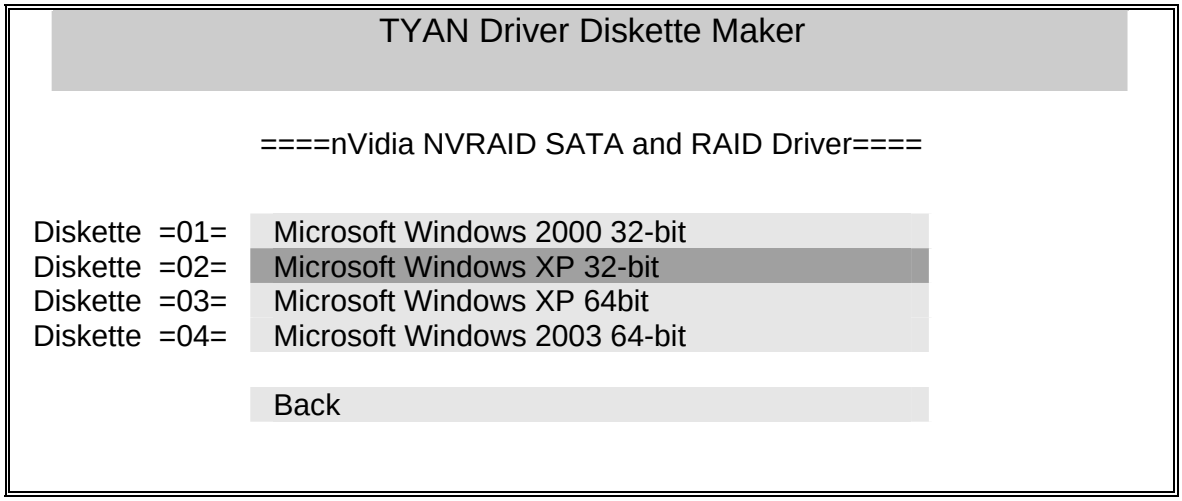
2. Choose the chipset vender which you need from the main menu.



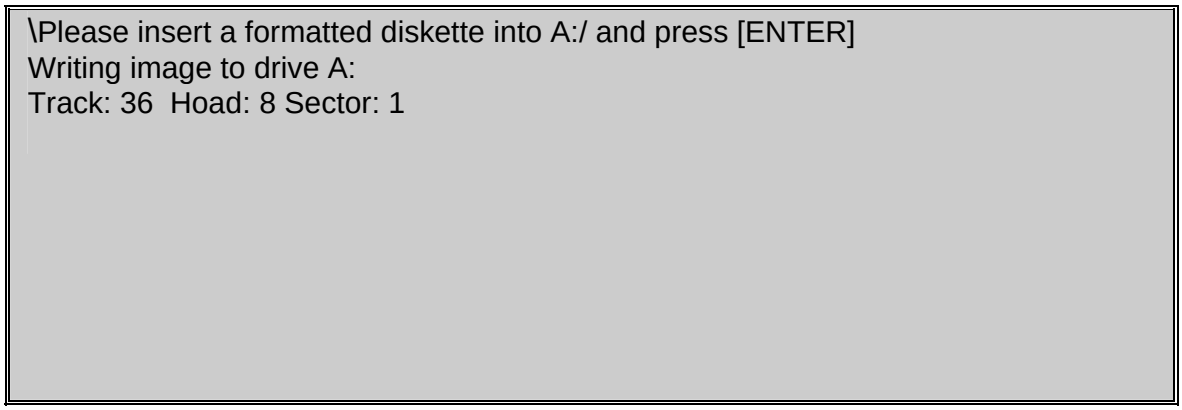
3. The following picture pops up after selecting the chipset model.



4. After selecting the chipset model, select the OS to start the diskette making.


TYAN Driver Diskette Maker
====nVidia NVRAID SATA and RAID Driver====
Diskette =01= Microsoft Windows 2000 32-bit
Diskette =02= Microsoft Windows XP 32-bit
Diskette =03= Microsoft Windows XP 64bit
Diskette =04= Microsoft Windows 2003 64-bit
Back

5. Follow the instruction on menu to insert a diskette and press [ENTER].



6. Using "ESC" key to quit the TYAN diskette maker. The system will automatically restart.

Glossary

ACPI (Advanced Configuration and Power Interface): a power management specification that allows the operating system to control the amount of power distributed to the computer's devices. Devices not in use can be turned off, reducing unnecessary power expenditure.

AGP (Accelerated Graphics Port): a PCI-based interface which was designed specifically for demands of 3D graphics applications. The 32-bit AGP channel directly links the graphics controller to the main memory. While the channel runs only at 66 MHz, it supports data transmission during both the rising and falling ends of the clock cycle, yielding an effective speed of 133 MHz.

ATAPI (AT Attachment Packet Interface): also known as IDE or ATA; a drive implementation that includes the disk controller on the device itself. It allows CD-ROMs and tape drives to be configured as master or slave devices, just like HDDs.

ATX: the form factor designed to replace the AT form factor. It improves on the AT design by rotating the board 90 degrees, so that the IDE connectors are closer to the drive bays, and the CPU is closer to the power supply and cooling fan. The keyboard, mouse, USB, serial, and parallel ports are built-in.

Bandwidth: refers to carrying capacity. The greater the bandwidth, the more data the bus, phone line, or other electrical path can carry. Greater bandwidth results in greater speed.

BBS (BIOS Boot Specification): a feature within the BIOS that creates, prioritizes, and maintains a list of all Initial Program Load (IPL) devices, and then stores that list in NVRAM. IPL devices have the ability to load and execute an OS, as well as provide the ability to return to the BIOS if the OS load process fails. At that point, the next IPL device is called upon to attempt loading of the OS.

BIOS (Basic Input/Output System): the program that resides in the ROM chip, which provides the basic instructions for controlling your computer's hardware. Both the operating system and application software use BIOS routines to ensure compatibility.

Buffer: a portion of RAM which is used to temporarily store data; usually from an application though it is also used when printing and in most keyboard drivers. The CPU can manipulate data in a buffer before copying it to a disk drive. While this improves system performance (reading to or writing from a disk drive a single time is much faster than doing so repeatedly) there is the possibility of

losing your data should the system crash. Information in a buffer is temporarily stored, not permanently saved.

Bus: a data pathway. The term is used especially to refer to the connection between the processor and system memory, and between the processor and PCI or ISA local buses.

Bus mastering: allows peripheral devices and IDEs to access the system memory without going through the CPU (similar to DMA channels).

Cache: a temporary storage area for data that will be needed often by an application. Using a cache lowers data access times since the information is stored in SRAM instead of slower DRAM. Note that the cache is also much smaller than your regular memory: a typical cache size is 512KB, while you may have as much as 4GB of regular memory.

Closed and open jumpers: jumpers and jumper pins are active when they are “on” or “closed”, and inactive when they are “off” or “open”.

CMOS (Complementary Metal-Oxide Semiconductors): chips that hold the basic startup information for the BIOS.

COM port: another name for the serial port, which is called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another). Parallel ports transmit the bits of a byte on eight different wires at the same time (that is, in parallel form, eight bits at the same time).

DDR (Double Data Rate): a technology designed to double the clock speed of the memory. It activates output on both the rising and falling edge of the system clock rather than on just the rising edge, potentially doubling output.

DIMM (Dual In-line Memory Module): faster and more capacious form of RAM than SIMMs, and do not need to be installed in pairs.

DIMM bank: sometimes called DIMM socket because the physical slot and the logical unit are the same. That is, one DIMM module fits into one DIMM socket, which is capable of acting as a memory bank.

DMA (Direct Memory Access): channels that are similar to IRQs. DMA channels allow hardware devices (like soundcards or keyboards) to access the main memory without involving the CPU. This frees up CPU resources for other tasks. As with IRQs, it is vital that you do not double up devices on a single line. Plug-n-Play devices will take care of this for you.

DRAM (Dynamic RAM): widely available, very affordable form of RAM which looses data if it is not recharged regularly (every few milliseconds). This refresh requirement makes DRAM three to ten times slower than non-recharged RAM such as SRAM.

ECC (Error Correction Code or Error Checking and Correcting): allows data to be checked for errors during run-time. Errors can subsequently be corrected at the same time that they're found.

EEPROM (Electrically Erasable Programmable ROM): also called Flash BIOS, it is a ROM chip which can, unlike normal ROM, be updated. This allows you to keep up with changes in the BIOS programs without having to buy a new chip. TYAN's BIOS updates can be found at http://www.tyan.com

ESCD (Extended System Configuration Data): a format for storing information about Plug-n-Play devices in the system BIOS. This information helps properly configure the system each time it boots.

Firmware: low-level software that controls the system hardware.

Form factor: an industry term for the size, shape, power supply type, and external connector type of the Personal Computer Board (PCB) or motherboard. The standard form factors are the AT and ATX.

Global timer: onboard hardware timer, such as the Real-Time Clock (RTC).

HDD: stands for Hard Disk Drive, a type of fixed drive.

H-SYNC: controls the horizontal synchronization/properties of the monitor.

HyperTransport™: a high speed, low latency, scalable point-to-point link for interconnecting ICs on boards. It can be significantly faster than a PCI bus for an equivalent number of pins. It provides the bandwidth and flexibility critical for today's networking and computing platforms while retaining the fundamental programming model of PCI.

IC (Integrated Circuit): the formal name for the computer chip.

IDE (Integrated Device/Drive Electronics): a simple, self-contained HDD interface. It can handle drives up to 8.4 GB in size. Almost all IDEs sold now are in fact Enhanced IDEs (EIDEs), with maximum capacity determined by the hardware controller.

IDE INT (IDE Interrupt): a hardware interrupt signal that goes to the IDE.

I/O (Input/Output): the connection between your computer and another piece of hardware (mouse, keyboard, etc.)

IRQ (Interrupt Request): an electronic request that runs from a hardware device to the CPU. The interrupt controller assigns priorities to incoming requests and delivers them to the CPU. It is important that there is only one device hooked up to each IRQ line; doubling up devices on IRQ lines can lock up your system. Plug-n-Play operating systems can take care of these details for you.

Latency: the amount of time that one part of a system spends waiting for another part to catch up. This occurs most commonly when the system sends data out to a peripheral device and has to wait for the peripheral to spread (peripherals tend to be slower than onboard system components).

NVRAM: ROM and EEPROM are both examples of Non-Volatile RAM, memory that holds its data without power. DRAM, in contrast, is volatile.

Parallel port: transmits the bits of a byte on eight different wires at the same time.

PCI (Peripheral Component Interconnect): a 32 or 64-bit local bus (data pathway) which is faster than the ISA bus. Local buses are those which operate within a single system (as opposed to a network bus, which connects multiple systems).

PCI PIO (PCI Programmable Input/Output) modes: the data transfer modes used by IDE drives. These modes use the CPU for data transfer (in contrast, DMA channels do not). PCI refers to the type of bus used by these modes to communicate with the CPU.

PCI-to-PCI bridge: allows you to connect multiple PCI devices onto one PCI slot.

Pipeline burst SRAM: a fast secondary cache. It is used as a secondary cache because SRAM is slower than SDRAM, but usually larger. Data is cached first to the faster primary cache, and then, when the primary cache is full, to the slower secondary cache.

PnP (Plug-n-Play): a design standard that has become ascendant in the industry. Plug-n-Play devices require little set-up to use. Devices and operating systems that are not Plug-n-Play require you to reconfigure your system each time you add or change any part of your hardware.

PXE (Preboot Execution Environment): one of four components that together make up the Wired for Management 2.0 baseline specification. PXE was designed to define a standard set of preboot protocol services within a client with the goal of allowing networked-based booting to boot using industry standard protocols.

RAID (Redundant Array of Independent Disks): a way for the same data to be stored in different places on many hard drives. By using this method, the data is stored redundantly and multiple hard drives will appear as a single drive to the operating system. RAID level 0 is known as striping, where data is striped (or overlapped) across multiple hard drives, but offers no fault-tolerance. RAID level 1 is known as mirroring, which stores the data within at least two hard drives, but does not stripe. RAID level 1 also allows for faster access time and fault-tolerance, since either hard drive can be read at the same time. RAID level 0+1 is both striping and mirroring, providing fault-tolerance, striping, and faster access all at the same time.

RAIDIOS: RAID I/O Steering (Intel)

RAM (Random Access Memory): technically refers to a type of memory where any byte can be accessed without touching the adjacent data and is often referred to the system's main memory. This memory is available to any program running on the computer.

ROM (Read-Only Memory): a storage chip which contains the BIOS; the basic instructions required to boot the computer and start up the operating system.

SDRAM (Synchronous Dynamic RAM): called as such because it can keep two sets of memory addresses open simultaneously. By transferring data alternately from one set of addresses and then the other, SDRAM cuts down on the delays associated with non-synchronous RAM, which must close one address bank before opening the next.

Serial port: called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another).

SCSI Interrupt Steering Logic (SISL): Architecture that allows a RAID controller, such as AcceleRAID 150, 200 or 250, to implement RAID on a system board-embedded SCSI bus or a set of SCSI busses. SISL: SCSI Interrupt Steering Logic (LSI) (only on LSI SCSI boards)

Sleep/Suspend mode: in this mode, all devices except the CPU shut down.

SDRAM (Static RAM): unlike DRAM, this type of RAM does not need to be refreshed in order to prevent data loss. Thus, it is faster and more expensive.

Standby mode: in this mode, the video and hard drives shut down; all other devices continue to operate normally.

UltraDMA-33/66/100: a fast version of the old DMA channel. UltraDMA is also called UltraATA. Without a proper UltraDMA controller, your system cannot take advantage of higher data transfer rates of the new UltraDMA/UltraATA hard drives.

USB (Universal Serial Bus): a versatile port. This one port type can function as a serial, parallel, mouse, keyboard or joystick port. It is fast enough to support video transfer, and is capable of supporting up to 127 daisy-chained peripheral devices.

VGA (Video Graphics Array): the PC video display standard

V-SYNC: controls the vertical scanning properties of the monitor.

ZCR (Zero Channel RAID): PCI card that allows a RAID card to use the onboard SCSI chip, thus lowering cost of RAID solution

ZIF Socket (Zero Insertion Force socket): these sockets make it possible to insert CPUs without damaging the sensitive CPU pins. The CPU is lightly placed in an open ZIF socket, and a lever is pulled down. This shifts the processor over and down, guiding it into the board and locking it into place.

Technical Support

If a problem arises with your system, you should turn to your dealer for help first. Your system has most likely been configured by them, and they should have the best idea of what hardware and software your system contains. Furthermore, if you purchased your system from a dealer near you, you can bring your system to them to have it serviced instead of attempting to do so yourself (which can have expensive consequences).

If these options are not available for you then Tyan Computer Corporation can help. Besides designing innovative and quality products for over a decade, Tyan has continuously offered customers service beyond their expectations. Tyan's website (**www.tyan.com**) provides easy-to-access resources such as in-depth Linux Online Support sections with downloadable Linux drivers and comprehensive compatibility reports for chassis, memory and much more. With all these convenient resources just a few keystrokes away, users can easily find the latest software and operating system components to keep their systems running as powerful and productive as possible. Tyan also ranks high for its commitment to fast and friendly customer support through email. By offering plenty of options for users, Tyan serves multiple market segments with the industry's most competitive services to support them.

"Tyan's tech support is some of the most impressive we've seen, with great response time and exceptional organization in general" - Anandtech.com

Please feel free to contact us directly for this service at **techsupport@tyan.com**

Help Resources:

1. See the beep codes section of this manual.
2. See the TYAN website for FAQ's, bulletins, driver updates, and other information: http://www.tyan.com
3. Contact your dealer for help BEFORE calling TYAN.
4. Check the TYAN user group: alt.comp.periphs.mainboard.TYAN

Returning Merchandise for Service

During the warranty period, contact your distributor or system vendor FIRST for any product problems. This warranty only covers normal customer use and does not cover damages incurred during shipping or failure due to the alteration, misuse, abuse, or improper maintenance of products.

NOTE: A receipt or copy of your invoice marked with the date of purchase is required before any warranty service can be rendered. You may obtain service by calling the manufacturer for a Return Merchandise Authorization (RMA) number. The RMA number should be prominently displayed on the outside of the shipping carton and the package should be mailed prepaid. TYAN will pay to have the board shipped back to you.

Notice for the USA
Compliance Information Statement (Declaration of Conformity Procedure) DoC
FCC Part 15: This device complies with part 15 of the FCC Rules

Operation is subject to the following conditions:

This device may not cause harmful interference, and
This device must accept any interference received including interference that may cause undesired operation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try one or more of the following measures:

Reorient or relocate the receiving antenna.
Increase the separation between the equipment and the receiver.
Plug the equipment into an outlet on a circuit different from that of the receiver.
Consult the dealer on an experienced radio/television technician for help.

Notice for Canada
This apparatus complies with the Class B limits for radio interference as specified in the Canadian Department of Communications Radio Interference Regulations. (Cet appareil est conforme aux norms de Classe B d'interference radio tel que specifie par le Ministere Canadien des Communications dans les reglements d'ineteference radio.)

Notice for Europe (CE Mark)
This product is in conformity with the Council Directive 89/336/EEC, 92/31/EEC (EMC).

CAUTION: Lithium battery included with this board. Do not puncture, mutilate, or dispose of battery in fire. Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by manufacturer. Dispose of used battery according to manufacturer instructions and in accordance with your local regulations.

Document #: D1780-100